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OUR GREAT TRIAL OFFER.

To afford the opportunity to mechanics and others of examining and testing the value of The TRADE REVIEW AND WESTERN MACHINIST, to themselves, the Proprietor will send this Journal three months, for only FIFTY CENTS. postage paid, to any address in this country or Canada.

POSITION OF IRON.

The position of iron in the West evidently depends largely on the strikes. These have already imparted a firmness both to raw and finished iron that was previously wanting, and a buyant feeling prevades the market, stimulated by the large orders given by buyers who had previously held aloof from making purchases except for current requirements. These are encouraged by the assured prospect of steadiness. The stock in first hands is by no means large. Good foundry is scarce, and sellers of special grades hold for outside figures. The production of western furnaces generally has been much curtailed the last two months. Mills are holding merchant iron at $2.65. There is a disposition to charge higher than the card in view of a probably active demand setting in. Present western requirements can readily be met. The falling off in the inquiries for steel rails is noticeable. Railway companies appear disposed to curtail the work of renewal. Heavy deliveries, however, on back orders are reported. Iron rails are simply nominal, and a very slight business has been done in these, while for scrap, quotations are simply nominal. As to the general situation the uncertainty as to the issue of the strikes attaches to the future of the iron market. So far there is no indication of a settlement, though it is not unlikely to be prompted by the act of the Manufacturers' Association at the meeting held last week at Pittsburg reaffirming their previous determination not to pay any advance whatever. The stoppage of a large number of iron mills has not increased the demand for low grade steel.

INVENTIONS AND IMPROVEMENTS.

Our able contemporary, the LONDON IRON TRADE EXCHANGE, in an article on "Invention," observes: "Inventions are always shifting; at one time there is a run for improved furnaces, at another for improved modes of constructing ships, then comes a change to machinery or some matter of great public interest, like the rivalry in the improving of the different systems of electric lightning. Not only do inventions shift from one branch of science and mechanics to another, but at times a lull comes over one country and a great outbreak of inventive genius bursts over another country. Some writers maintain such a lull at present is being experienced in this country, while the fervor of inventive genius burns high in America. It is true no doubt that there is a happy audacity in the American mind of the present day, which conducts it to many remarkable labor-saving devices that would hardly be dreamt of in the old country. To their enterprising mind no piece of machinery or labor-saving apparatus appears perfect. However simple its purpose, they endeavor to make it lighter, more efficacious, or do away with it altogether by introducing something better. They are ever searching to obtain some desired end through changes in old machinery and appliances, or in the substitution of more efficient means to obtain better results. We think it may be admitted that our American cousins have of late years shown more skill in making improvements, but that is a very different thing from inventions. "This does not appear to be a very discriminating allotmemt of merit, this country having prominently distinguished itself in originating methods by which what had been previously done for ages by hand is effected by machinery. Its very improvements, too, have so changed the character of implements and machines, increasing their power and efficiency as to properly class them with inventions. The international exhibitions of Europe have afforded abundant evidence of this. It is true of all inventions that the germ of them, so far as the principle is concerned, may be traced back, that the fact remains that in the last quarter of a century, so prolific in scientific and mechanical advancement, this country has been in the van of nations. Even so far as improvements are concerned, we learn of few made abroad on those brought out in the United States. It is here that improvements, if capable of further improvement, will, as a rule, occur. The less cost in obtaining patents, as compared with England, and the attention here given to technical education are reasons assigned by our contemporary for the multiplicity of American "improvements," tools being particularly specified, but impediments presented by heavy patent charges do not account for the difference. Our contemporary adds that "these improvements are to be considered as extensions," to which we rejoin that improvements in certain lines admitting of wide and important application necessarily by virtue of their merit take precedence over a host of original devices, which mostly turn out mechanical or commercial failures, the models lumbering the patent office at Washington. The very spirit of our institutions, tending, as it does, to break up those conventional ideas with which European artisans are bound, aids the genius of invention. Although science of old reached Europe from the East, its most practical and valable applicacations will, doubtless, in the future, as in the past, come to her from the West. Our contemporary has hit the mark in saying that to the American miud no piece of machinery or labor saving apparatus appears perfect.

LAND AND WATER ROUTES.

The lesser cost of transportation on water lines as compared with railroads, necessarily exerts an influence on the rates of the latter when coming into competition with them. As to grain, ore, coal, lumber, water lines may be considered a real governing force. The comparatively small extent of internal water communication in this country necessarily limits there modifying influence on freight charges to the transportation to the seaboard of the products of western and north-western States to the lakes in connection with the Canadian canals and the St. Lawrence river, and to the Mississippi river. The Missouri river, owing to the extension of railways west of the Mississippi, has become of comparatively small importance as a commercial highway. Had the Northern water lines and the Mississippi river a connecting link, by which vessels could pass from one to the other, they would exert a still greater effect on railway charges. Railroads appear to be continually gaining over water transportation, owing to the special facilities they offer, particularly in rapid transportation, constantly a necessity now that markets are telegraphically connected, but much has been accomplished in favoring the lake routes by the improved vessels of larger tonnage that have been built of late years and more particularly steam craft. Expenses of handling and expenses of a clerical nature are practically the same on land as on the water lines. Our gross lake tonnage does not materially increase, but the advanced character of the craft is an important point in encouraging shipments. Through the improvements carried out on the Mississippi river and the rising commercial importance of New Orleans, and the fleets of barges being launched on its waters for delivery of products at that port, it promises to become of increasing value in the carrying trade. With the ever enlarging productiveness of the country, our lakes and the Mississippi river will, as we believe, eventually show a larger traffic than ever. The influence of the Welland Canal, to which we shall advert hereafter in this connection has, yet to be felt in a more important degree.

PRODUCTIVE FORCES.

The workmen of this country cannot too closely study political economy, especially with reference to those prime factors in the world's existence, capital and labor which are constantly operating as productive forces, terms often misapprehended and abroad made to do service for communistic and socialistic schemes, the fact not being regarded that capital is the product of previous labor, available for calling into activity, giving scope for and attaching increased value to present labor. Notwithstanding strikes, which are to be regarded as adjusting movements, testing the true market value of labor, there is no country, excepting perhaps France—and this from the fact of its having so large a body of independent capitalists, in which the functions of capital, as a producer of value, is better understood; but there is still occasion for the diffusion of more knowledge on this point, such knowledge as would prevent rash impetuosity taking the place of reason, and which would allay much unreasonable discontent. We know no work that will more completely subserve this purpose than Mr. Elder's work on POLITICAL ECONOMY.* Its author justly remarks: "The general proposition—Labor is the creator of values—needs to be guarded against misconstruction. Labor is simply a prime agent of production, just as native ability is the basis of all mental attainment," and he finds its analogy in the seed, the product of which is not only due to itself, but to the cooperative influences of soil, air, rain and sunshine. He eloquently and truly remarks: "Man stands in the presence of external nature in the attitude of a combatant, and his conquest of its forces, and his use of its contributions to his service, are his force in all the kinds of labor he exerts upon it." Capital has been sententiously described as "dried labor;" it contributes to the product just as do the wheels and pulleys of a machine. Representing, as does capital, the fruit of previous labor, it need not, in order to constitute such fruit, be money, but may be raw material

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and clothing. So far as it is money, it is an immediate actual force; when the money is applied to buying coal lands and erecting manufactories it is capital in another form, but still the transmuted product of previous labor. When unused, that is, awaiting the application of labor, it is like latent heat, ready, under proper conditions, to evolve new activity. Labor in its largest sense, embracing that of the head, heart and hands, is the cost of the indispensable supplies, comforts and luxuries of existence, and deals with material things, over which, through the progress of science and invention, it is ever obtaining increasing control. The demand for labor is an ever growing one, to meet ever enlarging wants and is stimulated and promoted by capital. Money represents all the forces in this service. It is active as an agent as well as a sign or counter, of the exchange value of all other things—such as labor, raw materials, machinery and the intelligent direction of work performed. As in the Ptolemaic system says Mr. Elder, it is the outermost revolving sphere which gives motion to all the rest. A country without capital has foot paths for its highways; with capital it has railroads. Runners are the express messengers of the one, the electric telegraph carries the mssages of the other. The labor of the past is not dead; it is alive in the in the capital of to-day.

LAKE SHIPPING AND FREIGHTS.

It must be admitted that lake traffic is at the present somewhat dull and that the rates obtaining are unsatisfactory to shippers. We do not anticipate that this state of affairs will last long. Shippers who think to have rates a few weeks hence as low as they are now are likely to be disappointed. Exceptional circumstances have operated against lake shipping. The Trunk railway lines by their suicidal war rates drew to themselves a large amount of through traffic from the West that would otherwise have gone by water, and although those rates have been advanced immediate reaction is not to be looked for. A short time, however, will show a difference. Our advices from the great lumber shipping ports are to the effect that freights are very heavy, and the holiday fleet on the market is much smaller than had been anticipated. Shipments of lumber however, are likely to be smaller than last year. The lumber on docks of Saginaw river mills is estimated at 270,000,000 feet, being 40,000,000 feet short of the amount at dock at this time last year, but the falling off is not such as is likely appreciably to affect charters. At present the lumber freights at Saginaw to Ohio ports are $1.25 to $1.20. The Lake Superior iron and copper mines will make heavier shipments throughout the navigation season than last year, the leading companies having secured more powerful machinery, sunk additional shafts, and generally enlarged mining operations. We may here mention as a matter of interest that from the opening of navigation up to the 24th ult., the shipments of iron ore from Escanaba were 593,299 tons; from Marquette 292,026 tons and from L'Ansette 13,300 tons, making a total of 898,623 tons as against 460,454 tones in 1881, up to same date, a difference in favor of the shipments of this year of 438,170 tons. Although the copper product of the Lake Superior mines is much larger than last year, shipments as compared with the corresponding period of last year do not exhibit the same increase. It has been the policy of the leading companies to keep back stock with the view of maintaining artificial rates. Steamers are each successive year cutting a larger figure in the conveyance of ore as well as coal. Cleveland has materially added to her iron tonnage, and in the proportion that steamers are multiplied are freights of sailing vessels likely to be depressed.

RAILWAY CONSTRUCTION.

Advance sheets of Poor's RAILWAY MANUAL for 1881 shows that the aggregate mileage of new road built during that year was 9,358, or greater than that of any preceding year in the history of our country; the nearest approach to it being in 1871, when 7,279 miles were built. With an average cost per mile of $25,000, the total amount of money spent in this work was $233,000,000. In addition, at least $75,000,000 were expended on lines in progress, and $100,000,000 in improving the track on old roads, in building new stations, and in adding to their equipments; so that the total sum in round numbers was $400,000,000. Both the gross and net earnings of the railroads in operation showed a notable increase in 1881, the former having reached $725,325,119, while the latter were $272,654,119; the cost of operating having been $449,565,071, or 62 per cent. of the gross earnings. The railroads of the United States paid $128,887,002 for interest on their funded debts, and distributed $93,344,200 in dividends, against $77,115,411 in 1880. The capital and funded debt in 1881 was $5,010,389,579 on 94,486 miles of road operated in 1881, against $4,897,401,997 on 84,225 miles in 1880. The monthly returns of the leading roads were larger than for the corresponding period of the present year.

THE rejection by the House of Representatives at Washington of the bill for the appointment of a commission for the testing of steel and iron, is a matter of regret. The bill was promoted by leading makers of steel and iron throughout the country. The advantages that would have accrued from the experimental tests that such a commission would have instituted, have been very fully set forth in our columns. The proposal will, without doubt, be again brought up at the next session of Congress. Meanwhile measures should be taken to enlighten Congressmen as to its merits. The tests being carried out abroad are inadequate for American service owing to the different qualities of our iron and steel, and additional data are needed to serve as a guide in the blending of ores, so that results in regard to tensile strength may be more calculable.

MANUFACTURES.

TO MACHINISTS. MANUFACTURERS AND OTHERS.

THE publishers of THE TRADE REVIEW solicit items of information concerning manufacturing and other establishments in any part of the country, and all such items will be promptly inserted in these columns, free of charge. Facts are the only things needed; and all communications should be accompanied with the name of the contributor—not for publication—but as a guarantee of good faith.

Manufacturers, machinist and engineers are particularly requested to communicate any matters of interest relating to their specialties. No one need be deterred from sending any interesting facts in his own language, as all such contributions will be properly revised befor sendin to press.

OHIO INDUSTRIES.

THE work of remodeling, improving and extending among the iron manufaeturers still goes on despite the many obstacles thrown against it by the "great strike." "Blood will tell," and so also will honest work win for itself a reputation and demand for its products. Prominent among Cleveland manufactories are the Globe Iron Works, the largest works of their kind west of the Alleghenies. The company was established in 1853 for the purpose of vessel repairing and marine jobbing, etc. The honest effort, care and completeness they exhibited in every line of work entrusted to them spread their reputation, and the consequent demand upon them obliged them to add to their faciilties, which they have enlarged upon from time to time, striving to accommodate the rapidly growing requirements of the trade. To more successfully accomplish this, having found their present quarters inadequate, they are now erecting a building which when finished will be one of the best, if not the best, machine shops for marine work in the West. This building which is but a part of the works, will have a frontage on Elm street of 115 feet, and on Spruce street of 88 feet,and will take in a blacksmith shop 39x45 feet, a tool room 19x15 feet, and a machine shop 88x76 feet. The main building will be three stories high, and will be built in the most thorough and substantial mrnner. Some idea of this may be had from the fact that the joists on the first floor will be 8x3 planking spaced 14 inches, while on the third floor they are 2x12 spaced 18 inches. The walls, which are of brick, are 16 inches thick with 24-inch pilasters. The second floor will be supported by wooden columns 14x14. Everything is so arranged that in case of fire the wood work will not endanger the walls or impair their strength. When finished the building will have three stalls with a space of 37 feet, and will be fitted with traveling frames with a lateral range of 31 feet, and capable of lifting from 25 to 30 tons. The shops will be supplied with cranes for heavy lifting, which will be run by steam; an 8x8 double hoisting engine is now being built for this purpose. The company last year added an iron ship yard to their works, and are now able to furnish complete vessels of wood or iron of the largest dimensions. In connection with their marine work the company manufacture stationery, portable, blowing and hoisting engines, narrow gauge locomotives, rolling mill machinery, tanks, stills, coarse sheet iron work, and general castings. The company furnish employment to 300 men, and double this number during some parts of the season. The present members of the company are J. B. Cowle, J. F. Pankhurst, R. Wallace and H. D. Coffinberry.

THE numerous new concerns that are springing up in Cleveland afford evidence that shrewd business men are not slow to perceive and take advantage of the facilities this city affords as a manufacturing site. The firm of Wm. Eynon & Sons have recently engaged in the manufacture of milling machines, index centres, centering machines, universal vices, and die sinking machines. Their works are located on Scranton avenue. The shop is a model one, and is filled with machinery of the latest and most approved make, enabling them to fill orders with greater promptitude than would otherwise be possible. They make five sizes of milling machines, power feed, hollow spindle and back gearing. These machines are constructed in the most thorough manner, great care being taken to secure stiffness and solidity. All bearings are accurately scraped, no emery being used; they are just the thing for machine-shop work, such as fluting tapsand reamers and milling key seats in shafting. Mr. Eynon, the senior member of the firm, is a thoroughly skilled mechanic, fully acquainted with every department of the business, and gives his personal supervision to all details. Parties desiring any of the above-mentioned machines would do well to correspond with the firm, who offer only first-class work.

THE Akron Machine Works of Messrs. Taplin, Rice & Co., of Akron, manufacturers of steam engines, mill gearings, and heating and cooking stoves, etc., which was established in 1861, and subsequently incorporated in 1871, have recently replaced two cupolas, put in a new blower, built an addition to their buildings and made several other improvements. The main works now occupy two lots, one 200x300 feet, the other 120x180 feet.

THE Lane & Woodworth Glass Roofing Works, Youngstown, have closed down for the season, as is the custom of all glass works during the hot months of July and August. During the stoppage it is intended to reline the tank, repair the ovens, erect a packing house, and make a number of smaller repairs that have become necessary.

SMITH, MYERS & SNYDER, Cincinnati, are full of orders for their engine, boilers and saw mills. A boiler and saw mill has just been dispatched to Osceola, Ark.; also to the Marietta and North Georgia railroad, an engine, boiler and complete saw mill rig. The mill is located at Marietta, Ga.

THE Barney & Smith Manufacturing Co., Dayton, are actively engaged in the construction of passenger and freight cars, from three to four months' orders from old contracts having yet to be filled. They have just received a new steam hammer and are employing 1,200 men.

BENTEL, MARGDANT, & Co., Hamilton, manufacturers of wood working machinery, have introduced into the jig scroll saw an ingeniously contrived steel spring which affords an easy motion with an equal stretch of the saw blade, thus tending to dermanence and efficiency.

WM. RESOR & Co., Cincinnati, have just completed one of the most complete stove works in the country. Their foundry covers an area of 40,000 square feet and their warehouse 14,000 square feet. They have now 225 hands employed, which will be increased to about 350.

THE Swift Iron and Steel Works, of Cincinnati, are busy in all branches of their Newport and Riverside mills. Two new sheet trains will be started in a short time, while four new double-flue boilers, with gas furnaces, are being erected at Newport.

A COMPANY has proposed to establish a glass table-ware works at Massillon, which will at the start employ 125 hands, if the people of that city will donate to the company a site and $6,000 in cash. It is thought the proposition will be accepted.

THE production of cut nails in Ohio in 1881 amounted to 860,665 kegs of 100 pounds. In production this State was only preceded by Pennsylvania and West Virginia, the former turning out 1,914,706 kegs, and the latter 1,214,102 kegs.

THE Huber Manufacturing Co., of Marion, manufacturers of farm engines and threshers, rotary hay rakes, road scrapers, etc., have increased their capital from $75,000 to $150,000, and will increase their capacity in proportion.

A NUMBER of young men in Youngstown, having united their capital and labor, are about to engage, under the name of Clark & Co., in the manufacture of small square and hexagon nuts for the purpose of supplying other establishments.

THE Queen City Machine Works is the title of an industrial establishment recently started in Cincinnati, by Messrs. Reinshagen & Buckman, for the manufacture of machinists tools and specialties in iron and brass.

G. W. MOREDICK, Pomeroy, is adding considerable new machinery to his mill, including a six reel bolting chest, purifier and brush machine, all of which are furnished by C. B. Slater & Co., Blanchester, O.

THE Phœnix Furnace, near Youngstown, is being thoroughly repaired and put in shape for another five years' run. A new hearth is being constructed, and it is the intention to put a new hoisting engine in.

WORK was resumed on Tuesday last at the Bessemer steel rolling mill, Newburgh works by Cleveland Rolling Mill Company. All departments but one, which is undergoing repairs, are now in operation.

THE Corrugated Elbow Company, Cincinnati, are exceedingly busy filling orders for the stove and hardware trade. Their one-piece elbow is much more durable than elbows made in pieces.

THE construction of the necessary buildings, and the erection of machinery with which to manufacture explosive materials is still under way at the Youngstown powder works.

W. P. CALLAHAN & Co., Dayton, are running day and night. They have just added to their buildings a machine shop 60x80 feet and a foundry floor, 50x120 feet.

THE Stockwell Serew and Machine Co., Cleveland, are making important changes in their factory so as to enable them to promptly fill their numerous orders.

THE Morse Bridge Works, Youngstown, are running extra time on their contract with the Connellsville extension of the Pittsburgh & Lake Erie

MESSRS. Carter & Johnson, Akron Cutlery Works, are running on pocket-knives, of which they are now turning out about 400 to 500 dozen per month.

THE Consolidated Coal and Mining Co., of New Straitsville are placing in their Carbon Hill mine one of the Link Belt Co.'s coal elevators.

THOMAS THOMAS, of Erie, has secured a lease of the Hubbard Rolling Mill, and it will be started under his management in a short time.

GEORGE MEYERS and other capitalists of Sandusky are organizing a large joint stock company to start a large basket manufactory.

THE Buckeye Novelty Mannfacturing Co. is a newly incorporated company at Columbus, with a capital stock of $50,000.

THE Springfield Casket and Furniture Co., Springfield, has been incorporated with a capital stock of $50,000.

ALL departments of the Youngstown Stove Works are running full time, with orders booked ahead.

THE Youngstown Malleable Iron Co., with its new additons completed will have 125 employes.

THE Miller Co., Canton, manufacturers of steam pumps and farm bells, employ 800 men.

THE boiler makers of Cincinnati have resumed work at an advance of ten per cent.

CLARK & Co., Youngstown, have commenced operations at their nut and bolt works.

THE Sand Glass Co. has been incorporated at Toledo, with a capital of $50.000.

THE Mt. Vernon Lantern Co. has been removed to Cleveland.

THE East Liverpool Glass Company expect to start next month.

THE Falcon Furnace is damped down.

INDUSTRIES IN GENERAL.

MASSACHUSETTS.

THE Lowell Slate Co. has just been organized at Dover, with a capital of $200,000.

THE Walter A. Wood Machine Co., at Hoosic Falls, are now building over 200 machines per day employing 1400 hands; pay roll over $70,000 per month; using 50,000 feet of lumber and melting 50 tons iron daily. The capital stock of the company is $2,000,000.

AT Lowell, Pevey Bros, have recently made a large addition to their iron foundry, which gives them double their former capacity. A full force is employed, and already the increased accommodations are taxed to the utmost to keep up with orders.

THE Central Needle Co., which has just been incorporated at Springfield, is formed to regulate prices in the trade, and in fact to furnish a sort of clearing-house for the eight needle-manufacturing companies of the country, five of which are in New England. The National Needle Co., of that city turns out 50,000 needles a day of all grades, and has a constantly growing business.

THE Prushan Rubber Co., Hyde Park, are turning out 1000 garments of rubber per day.

CONNECTICUT.

THE Yale Lock Co,, of Stamford, has acquired Emery's testing machine patents, under which the famous Watertown machine was built, and a fifty-ton machine is now building for the Altoona shops of the Pennsylvania railroad.

THE Springville Co., of Rockville, has stopped work for awhile. It has a surplus of about $40,000, and its rule is to run, even without sales, in panics or flush times, until this surplus is expended. The works are then stopped to start again when the stock is disposed of.

THE directors of the Corbin Cabinet Lock, New Britain, will commence business in their new factory building on or about September 1.

—THE Bradley and Hubbard Co., the largest chandelier manufacturing concern in the world, is about to erect a new brass foundry 40 by 250 feet.

NEW YORK.

THE Rochester Car-Wheel Works have a capacity for turning out 125 car wheels a day. During the year ending April 1, 1882, they shipped 30,000 wheels. Passenger car wheels are warranted for one year, or 50,000 miles; and freight car wheels for three years.

THE Davidson Steam Co., Brooklyn, has been awarded the contract for the new fifteen million (15,000,000) gallon pumping engines for the city of Brooklyn.

AMERICA now manufactures seven-eighths of the perfumes used by Americans. In the city of New York alone there are sixteen perfumery establishments, producing annually $1,094,700 worth of goods.

A VENETIAN art glass company has been organized in New York, with a capital of fifty thousand dollars.

PENNSYLVANIA.

DURING the month of June 19,340 kegs of nails were manufactured at the nail factory of E. & G. Brooke Iron Co. In the same month 24,300 kegs were shipped to various parts of the United States.

THE Baker Car Heater Co. has been organized at Pittsburgh with $500,000 capital stock, and will engage in the manufacture of steam heaters for railroad cars under the Baker patents. The company begins business with orders for some $50,000 worth of heaters. It has received orders to equip with its improved heater 60 new passenger cars which the Pullman Car Works are now building for the New York, West Shore and Buffalo road.

IN consequence of the cancellation of a large number of orders for locomotives and the postponement of other orders, the force of men employed at the Baldwin Locomotive Works has been considerably reduced recently, and other discharges will follow.

THE Catasauqua Manufacturing Co., comes to the front with a round bar of ¾-inch diameter and 223 feet long, which was rolled in their 10-inch mill. This wonderful production is now on exhibition in front of the mill, and is said to be the longest ever rolled in America. Their usual length for this size is 100 feet.

THE Pittsburgh Locomotive Works have resumed after suspending a short time for overhauling and introducing new shafting at an outlay of $7,000.

VIRGINIA.

—HALF a million dollars have been raised for the locomotive works at Garfield. Contracts have been awarded for the erection of buildings to cost $100,000. They will be completed in three or four months. These comprise erection and machine shops 453x83 feet and two-stories high, a foundry 200x82, a boiler-shop 200x82, blacksmith-shop 200x52, a tender, truck and paint shop, and a pattern shop.

THE Central Virginia Iron Co. will soon begin to build a blast furnace near the Riverville mines, in Amherst county, Virginia.

BEFORE fall the manufacture of steel car wheels and car axles will be in active operation at the works of the Potomac Manufacturing Co., Alexandria. The machinery includes a rolling mill for steel works.

MICHIGAN.

THE Ottawa Iron Works Co., of Ferrysburg, have had such good success in building marine engines, that the proprietors have decided to build vessels complete, of any dimensions required.

ILLINOIS.

THE Calumet Tool Co's works, at South Chicago, are being remodeled and a new finishing room has been added. This company have taken up the manufacture of vises in connection with the making of tools, and are placing in new machinery.

THE Wilson Sewing Machine Co. now employ at their Grand Crossing works 200 men and report business good.

THE Chicago Hardware Mfg. Co. are putting additional machinery in their works, and report a good trade for the Niles patent mortise door knobs and hooks.

THE new glass works now building in St. Louis, are located at the corner of Dorcas and Main streets, on the line of the Iron Mountain railroad. The main building will be two stories high and 216 feet in length by 126 feet in breadth, and will be entered by two side tracks from the railroad belonging to the works. The works will start up in September with one furnace and eighteen ovens for tempering bottles, and will manufacture beer and soda bottles and fruit jars. Fred Heitz is proprietor of the new establishment. *American Pottery and Glassware Rep.*

INDIANA.

CONSIDERABLE activity is now prevailing in all departments of the Atlas Engine Works, of Indianapolis, and improved special machinery to provide for the growing demands of their trade, and valued at about $20,000, has recently been added. During the past two weeks 56 engines, most of them being furnished with complete outfits, have been shipped to various destinations.

MESSRS. Tucker and Dorsey, manufacturers of the celebrated alarm tills, stove trucks, &c., at Indianapolis, have their extensive new works in full running order, and are at this time turning

out large quantities of goods. The new building is a three-story brick structure, 132x45 feet, and power is supplied by a 60-horse-power engine.

NORTH CAROLINA.

A spoke and handle works is projected at Statesville.

GEORGIA.

ROME manufacturers contemplate constructing a canal seven miles long, to get a three thousand horse-power fall.

THE growth in Atlanta's manufacturers is wonderful. Three years ago, a small plow factory was established, doing the rudest kind of work. To-day, that institution employs two hundred and fifty men and pays out two thousand dollars per week in wages. The making of cotton-gins, plows, condensers and everything necessary to farm work, is extensively carried on, and the goods are sold as soon as made. In wagons, buggies, etc., Atlanta now supplies six States. Atlanta has just completed a grain elevator of two hundred thousand bushels capacity.

ENGLISH CORRESPONDENCE.

WOLVERHAMPTON, July 7.

The Pig Iron market both in the midland districts of England and in Scotland, is gradually but surely improving. The flatness which has prevailed has been almost unequalled in its duration. Scotch pig maintains its advance of 2s. (50c.) This improved demand is doubly welcome, principally because up to this moment it has not been in consequence of the American strikes, but has arisen slowly from the steadily increasing wants of the Colonies and the satisfactory condition of the home trade. Everything at the moment points to a healthy state of the iron trade of this country for some time to come. Iron masters find satisfaction at the prospect of a good harvest in the United States, trusting it will increase orders for iron. Those I have met with carefully guard themselves against taking too sanguine a view of the American strikes, but their information from the other side leads them to believe it will still be a source of considerable inconvenience to the American iron masters. Already English sheets have found their way into the American markets, and have been sold at a profit below the price of American-made sheets, and if the strikes continue this will be repeated in almost every branch of the iron industry. It is argued that up to the present moment the strikes have done something to stiffen the prices of iron all round by decreasing the American supply, and although this may not be very keenly felt at the moment, it will sooner or later tell very considerably on the price of manufactured iron. The improvement in makers' iron is even more marked than in warrants. There is a good American, Continental, and home demand for both special and ordinary pig iron. If the political situation does not become more complicated than at present, there is every appearance of a large autumn trade, and much better prices ruling than at present. In the West Cumberland district, which has a hematite iron trade, prices have improved somewnat, and 50s. may now be considered the nominal price for mixed numbers of Bessemer Pig Iron. Shipments have again been very heavy, and the Lamsdale Hematite Iron Company especially have been sending away large consignments of pig iron to America and the Continent. On the Glasgow market Pig Iron is changing hands at 49s. 2d. The Middlesbrough market is very firm. The underselling of merchants seems to have ceased, and the uniform quotations for No. 3 iron is now 43s. 6d.

In the finished iron trade there is rather a better feeling owing to a slight improvement in the demand for the best class of iron. Few of the makers of "marked" bars are able to run full time, but their order books as a rule are in a better state. The makers of common bars are fairly employed—and the mills rolling channel and girder iron are making good time. In the sheet trade the makers of galvanizing qualities are full of orders and there is a strong demand for future delivery. Some of the makers of best sheet iron for stamping purposes &c., complain of the underselling of some makers who are making steel sheets from common blooms. Such sheets will not bear the finish of charcoal iron sheets, but as the price is naturally low, they are being substituted for best iron. The result however is not likely to permanently affect the best sheet trade, although for the moment some of the makers are losing orders.

In the North of England, where there has been a good deal of cutting, merchants and makers' prices have become equalised. Occasionally a shade less than the makers' rates has been taken, but generally 43s. 6d. No. 3, is the rate on all sides. This has placed the makers, they consider, in a triumphant position. They have been for a long time fighting desparately against the "bears," and they consider that now they have gained their point, and it would seem that at least for the time being this is the case. That the "bear," however, is crushed out it would be altogether too much to assume, and that it would be to the makers' advantage to dispense with the merchant altogether is very doubtful. The merchant in times past pushed Cleveland iron into markets which it would have taken a much longer time to get into. The maker, I must remark, holds the merchant, too, very stringently in regard to payment for iron.

Here at Wolverhampton, the sellers of some descriptions of pigs are not closing many bargains, owing to the heavy purchases which were made by the forge and foundry owners nearly two months ago. Best iron made in this district still commands the highest figures realized this year, and some of the part-mine makers are selling at strong quotations. The chief sales among the Black Conntry smelters are those recorded for common cinder which fetches 42s. 6d. Derbyshire pigs are still in request for delivery in September and later on, and some of the Northampton agents are closing with buyers for delivery up to the end of the year.

The experiments being carried out to test the possibility of converting Staffordshire cinder iron into steel have attracted much attention, and a second trial has been watched with much interest at the Patent Shaft and Axletree Company's works at Wednesbury. Messrs. Thomas and Gilchrist, the patentees of the Basic process, were present, and the result announced by telegram is that four tons of ordinary cinder iron were converted into superior steel. Mr. Benjamin Hingley, chairman of the South Staffordshire Ironmasters' Association referring to the success of the experiment, expressed his opinion that the process would supersede puddling entirely. If this takes place tap cinder will also be abolished, and there will be no cinder iron to convert into steel; but no doubt other descriptions of iron can be used in the converter. The conversion of cinder iron into steel, however, is no novelty. Many of your readers may remember the results achieved by Mr. Sharman, an American patentee, who, in 1874, successfully produced the finest steel from ordinary cinder iron, worked in a puddling furnace at the Darlaston Steel and Iron Company's works at Wednesbury. Mr. Sharman also manipulated North Staffordshire pig iron with equally satisfactory results, and at the works of John Brown and Co. and Charles Cammel and Co., at Sheffield, gave similar results. But Mr. Sharman's process was not a commercial success. The Patent Shaft and Axletree Company are in a position to give the Thomas Gilchrist process a fair trial; and if the result of the experiments are as satisfactory from a commercial point as they are from the scientific standpoint, we shall soon hear of the new process being generally adopted.

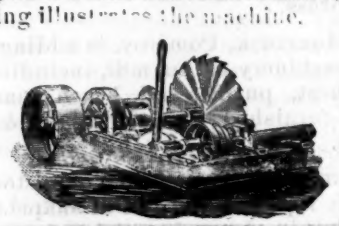
The English like the American public have been agitating the subject of railway rates. The Select Committee of the Houses of Lords and Commons on Railway Rates and Fares, has had before it the drafts of two reports, one of which, prepared by the chairman, proposes that in order to give the public protection against the capricious acts of railway companies, chambers of commerce and chambers of agriculture should have a locus standi before the Railway Commission. It advises that a right of appeal should be given from the decision of the Railway Commission, and that the jurisdiction of the Commission should be extended so that they should have powers to enforce the provisions of special and general Acts relating to railways, to give redress for illegal delays, and to impose damages for injury sustained. The cost of litigation at present prevents shippers who suffer loss and inconvenience from violation by the railway companies of special acts or public statutes seeking redress; a state of affairs which should not exist.

THE corn crop of the year ought to reach fifteen hundred million bushels, which is a fraction less than the great harvest of 1880. The corn crop of 1881 was about twelve hundred million bushels.

Crushing and Disintegrating Mill.

WHEELER & HEYER, ST. JOHNSBURY, VT.

Messrs. Wheeler, & Heyer, St. Johnsbury, Vt., have achieved an enviable reputation by the excellence of construction and the efficiency of their disintegrating mill for bones, oyster shells, guano, plaster and other hard substances. This mill is unquestionably one of the most desirable of its kind in the market whether for capacity, durability or general usefulness. Without any preparation green, raw bones are reduced by it into bone meal suitable for stock, fowls, or as a fertilizer, with a capacity from 2,500 to 5,000 pounds per day, and the same for oyster shells; and of phosphate, guano, plaster and kindred substances from five to ten tons per day. It is used with general satisfaction in mixing and pulverizing superphosphate, burnt bones, charcoal, clay, feed, corn, etc., etc., also for grinding chalk, lime, soapstone,—in fact it can be advantageously employed to reduce any substance not harder, more tenacious, moist or sticky than a green shinbone. Its peculiar construction causes it to discharge with ease many moist, damp and cloggy ground substances which would altogether choke other mills. They are of the best material and workmanship, being composed entirely of iron and steel, thoroughly fitted in every part, particularly recommending themselves for the ease and cheapness with which they may be repaired in case of accident. In most mills, the grinding surface consists of fillets, grooves, corrugations, etc., cast upon cylinders or cones. If while operating a mill so constructed a piece of iron gets in by accident (as often occurs in grinding bones) the cone is broken to pieces, necessitating delays and the purchase of a new mill, or the most expensive part of one. These mills rarely come to damage; the cutters, or so much of them as protrudes beyond the cylinder's periphery, may become battered or broken, and an hour's time will remove and repair them. The following illustrates the machine.



The bed piece is one solid casting about 2x3 feet, across which extends the shaft or arbor 4 feet long, resting on 7 inch boxes, which has a 6x10 inch drive pulley on end. The shaft goes axially through the heads and grinding cylinder which are arranged to fit the hopper (as will be seen from the cut). In front of the cylinder is the adjustable chute or cut table, carrying on its inner surface, or the part of it that is curved, a series of stationary grinding cutters which extend across it. This chute is carried to and from the cylinder by set-screws, its relative position to the grinding cylinder determining the fineness or coarseness of the material ground. The cylinder is 10 inches in diameter, 18 inches long, and has its periphery or grinding surface composed of a series of steel bars or cutters, backed into grooves cut in the cylinder, and held in position by the two heads, one of which is bolted to the cylinder, the other is held in place by a bolt running on the shaft. The hopper is about 13x18 inches square, 16 feet high, and is held in place by hooks on the side and has a hinged door or cover top to receive the substance to be ground. This mill is complete in itself, ready to start up, and should make from 1,000 to 1,200 revolutions per minute, and requires about five horse power to run it. With these mills is included by the makers a grinding machine; iron frame to bolt in front of a grindstone or emery wheel, by the aid of which cutters can be rapidly ground and set perfectly true, and which will answer as well for grinding planer knives. The shipping weight of the machine is 1,000 pounds. The scale on which Messrs. Wheeler & Heyer carry on the manufacture, enable them to supply the mill at a most reasonable cost.

THE post office earningsof the past year show a surplus of $2,000,000.

A ROAD one hundred and fifty miles long is to be built from Delphos, Ohio, to Cleveland, with a twenty mile branch to Akron.

In a good working belt all air is excluded between the belt and the surface of pulley; in such cases, fourteen or fifteen pounds atmospheric pressure is secured on the contact surface of belt on pulley.

ITEMS OF INTEREST.

MACHINES for cutting barbed wire are being patented.

NEW Zealand buys wood-working machinery in Chicago.

THE temperature of steel is regulated by the percentage of carbon.

THE Colorado wool product will be worth two million dollars this year.

IT will cost $2,000,000 to construct and equip the Baltimore and Ohio Telegraph line.

A bar of iron seventy feet long at a temperature of 32° Fahrenheit, heated to 212° expands one foot.

CAST iron is said to be permeable to certain gases at high temperatures, and to hydrogen gas even when cold.

IT is economy to put on a wider belt rather than make a narrow one too tight. Vertical belts should be drawn moderately tight.

"TRICYCLES," the Court Journal says, "grow in favor in London, and are to be seen daily, ridden by either sex, in the most crowded parts of the city."

ALL the Canada railroads get their coal supplies from the United States. Drifts have recently been opened in Canada, with the hope of finding coal in paying quantities.

THE industry in Pennsylvania, according to data furnished by the Bureau of Statistics, was represented by 6,671 ovens in 1881, and the total output of coke in the State for that year amounted to 2,168,506 tons.

NAPTHA and water for generating steam has been tried successfully on a locomotive specially constructed for the purpose. The large freight engines on the Erie find it difficult to draw such a load up the grade near Patterson, but the new engine accomplished the feat with ease.

THE lowest notch of the season for lake freight rates in Chicago has been reached. The last charters of corn to Buffalo have been one-half cent per bushel. Grain was taken as ballast, there being a dead loss at the figure named. Other freights are low in proportion and the market exceedingly dull.

SIXTY-SEVEN oil mills in the South have caused an advance in cotton seed from six dollars to twelve. Of the three million tons of cotton seed in the last year's crop, only one sixteenth was used, leaving seed enough as waste to make ninety-eight million gallons, worth, manufactured into oil, sixty-three million dollars.

SEVERAL railroads are introducing rails sixty feet in length, and as soon as the new mill in Chicago is fairly in operation, rails one hundred and twenty feet in length are to be manufactured, and tested on one of the Northwestern lines. This mill will be the only one in the country so constructed that a one hundred and twenty-foot rail can be turned out. The argument in favor of long rails is the fact that the chief wear on the rails is the joints, which become battered usually long before the body of the rail is much worn.

WE hear of parties, says the Industrial South, of Richmond, Va., who have negotiated for the delivery, in this city, to purchasers from the north of 1 000,000 feet of white pine, to be cut from land on the Richmond and Allegheny railroad in Botetourt county. The price to be paid is understood to be $26 a thousand, which is somewhat under the mark, but a concession was made by the seller on account of the largeness of the order and simplicity of details. The filling of the contract will give employment to axemen, teamsters, sawyers and others.

AN exchange tells the following good story of a young man who began business lately as a clerk in the hardware line. One day, when the boss was at dinner, a countryman came in to buy some nuts. He found an article to suit him, and wanted a dozen. The young man looked at the price list and found they were listed at twenty-five cents a dozen, thirty off. He gave a low inverted whistle, and then with a sudden inspiration he handed the customer five cents and told him he could buy the nuts at the other store. "By George!" he said, when he was telling his employer of the transaction: "I thought the best thing I could do was to save the nuts, anyhow!"

AN analysis of the census figures shows that not over 33 per cent. of the population of the country are engaged in agricultural pursuits, yet the tillers of the soil constitute the life of the nation. Strike them out and the nation would decay, die. Again, the population of the 100 principal cities of the United States in 1880 was about 10,000,000, or 20 per cent of the entire population, thus showing that the tendency is to the cities from the country. When it is considered that the wealth of a nation depends on its mineral and agricultural products chiefly, the census figures, as developed, are to a certain extent startling and suggestive in their character and, among other things, show that the young men of the land eschew agricultural pursuits.

MECHANICAL RECEIPTS.

Soldering Cast Iron.

Soldering cast iron is generally considered to be very difficult, but it seems to be only a question of thoroughly brightening the surface to be soldered, and using a good solder and a clean swab with muriatic acid. Sodium amalgam might be usefully employed for the purpose.

Anti Friction Composition.

An anti-friction composition, used with great success in Bavaria, instead of oil, tallow, etc., is thus made: Ten and one-half parts of lard are melted with two parts of pulverized plumbago; the lard is melted, the plumbago mixed in slowly, stirred well, and the mixture applied slowly.

To make an Enamel for Tinware or Iron.

Take fine kaolin three parts, silica one-half part calcined borax one part; mix and fuse in a crucible; remove from fire and stir in one part fine umber; cool quickly, grind to a fine powder, mix with water to a paste and apply to clean metal. Dry slowly in a warm place, then heat gradually till the enamel fuses; cool slowly.

Pulleys.

Light pulleys are better than heavy ones, as they make less friction and necessitate lighter or less frequent hangers, besides being cheaper. Pulleys should be given perfect running balance; screws throw pulleys out of center; keys tend to split the hubs. Both set screws and keys deface the shafting and render it unfit for a bearing surface should it be desired to place a hanger where a pulley has been. Compression couplings are best, and those kinds are preferable in which there is a split across the length of the gripping sleeve, so that the coupling will accommodate itself to shafts of slightly-differing actual nominal diameters,

To Secure Steadiness In Pinion Motion.

This motion transmitted by a pinion, whether it be the driver or the driven wheel, is frequently unsteady, on account of the fact that only one tooth is in action for the time being. The distance between the shafts or the required velocity ratio will often not permit the use of any other than a small pinion, and in order, therefore, to overcome the difficulty mentioned, the pinion may be made "stepped." A "stepped" pinion consists really of two pinions side by side, the teeth in one being just midway those in the other, the wheel gearing with it being arranged in the same way. This method is said to do away with all difficulties, insuring perfect regularity of action and greater durability.

Putting Saws In Cutting Order.

The grand secret of putting any saw in the best possible cutting order, consists in filing the teeth at a given angle to cut rapidly, and of a uniform length, so that the points will all touch a straight-edged rule without showing a variation of a hundredth part of an inch. Besides this, there should be just enough set in the teeth to cut a kerf as narrow as it can be made, and at the same time allow the blade to work freely without pinching. On the contrary, the kerf must not be so wide as to permit the blade to rattle when in motion. The very points of the teeth do the cutting. If one tooth is a twentieth of an inch longer than two or three on each side of it, the long tooth will be required to do so much more cutting than it should, that the sawing cannot be done well. Hence the saw goes jumping along, working hard and cutting slowly. If one tooth is longer than those on either side of it, the short ones do not cut, although the points may be sharp. When putting a cross-cut saw in order, it will pay well to dress the points with an old file, and afterwards sharpen them with a fine wetstone. Much mechanical skill is requisite to put a saw in prime order. One careless thrust with a file will shorten the tooth so much that it will be utterly useless, so far as cutting is concerned. The teeth should be set with much care, and the filing should be done with great accuracy. If the teeth are uneven at the points a large flat file should be secured to a block of wood in such a manner that the very points only may be jointed, so that the cutting edge of the same may be in a complete line or circle. Every tooth should cut a little as the saw is worked. The teeth of a hand-saw, for all sorts of work, should be filed fleaming, or at an angle on the front edge; while the back edges may be filed fleaming, or square across the blade. The best way to file a circular saw for cutting wood across the grain, is to dress every fifth tooth square across and about one-twentieth of an inch shorter than the others, which should be filed fleaming at an angle of about forty degrees.

USEFUL RECEIPTS.

CEMENT FOR STOVES.—To make a cement for stoves, take iron filings and mix to about the consistency of putty for glazing, with white lead and linseed oil. Fill in the joints as securely as possible when the stove is cold and let it stand a day or two before using.

TO FILTER WATER.—A tight brick box, of a capacity of eight or ten quarts, built in the bottom of a cistern, enclosing the end of the pump-pipe, cannot be exhausted, and will act as a perfect filter. Bricks are porous and water will pass through them as fast as it can be pumped out.

CEMENT FOR GLASS.—To make a cement for glass that will resist acids, take ten and one-half pounds of pulverized stone and glass, and mix with it four and three-fourths pounds of sulphur. Subject the mixture to such a moderate degree of heat that the sulphur melts. Stir until the whole becomes homogeneous, and then run it into molds. When required for use it is to be heated to 248 degrees, at which temperature it melts and may be employed in the usual manner. It resists the action of acids, never changes in the air, and is not affected in boiling water. At 230 degrees it is said to be hard as stone.

TO MAKE A BRIGHT GOLD LACQUER.—4 ounces shellac and ¼ ounce gamboge acetic ether. The solution is allowed to stand until the gummy matters, not taken up by the spirit, subsides. The clear liquor is then decanted, and when required for use is mixed with eight times its quantity of alcohol. In this case the pyro-acetic ether is employed for dissolving the shellac in order to prevent any but the purely resinous portions being taken up, which is almost certain to occur with ordinary alcohol; but if the lacquer were made entirely with pyro-acetic ether, the latter would evaporate too rapidly to allow time for the lacquer to be equally applied. Lacquers suffer a chemical change by heat and light, and must, therefore, be kept in a cool place and in dark vessels. The pans used should be either of glass or earthenware, and the brushes of camel's hair with no metal fittings.

HOW TO MAKE POLISHERS' GLAZE.—This is not a varnish, but a finish, applied after the work has been bodied-in in the usual way, and which saves the time and trouble of splitting off—small work especially. It is often applied with a brush, though some prefer a rubber, in which case it should be simply wiped on, and not rubbed. It is made by dissolving gum benzion in spirits. Fill a bottle about one-quarter up with the gum, broken small, and then fill up with spirits and let it stand a few hours.

TO DETECT LEAD IN TIN VESSELS.—For tinning kitchen utensils a very impure tin is used, containing lead in more or less quantity. Considering the dangerous nature of this sophistication, it will be well to have a ready means at hand to determine if the tinning of a vessel contains lead. For this purpose a small bit of tin is detached and put into a watch glass, with a drop of nitric acid and two or three drops of water; the glass is then gently heated over a flame, and when the solution is complete a few drops of water and a concentrated solution of iodide of potassium are added, when, if lead is present, a yellow precipitate will be the result.

BRIGHTENING JEWELRY AND GILDED WARE.—

Ordinary gold jewelry may be effectually cleansed by washing with soap and warm water, rinsing in cold water and drying in warm boxbood sawdust. Plain, smooth surfaces may be rubbed with chamois leather charged either with rough or prepared chalk, but the less rubbing the better. Silver is liable to tarnish by the action of sulphur, and where there is fine chased or engraved work the extreme delicacy of the lines may be injured by much rubbing. In such cases the articles may be cleaned by washing with a solution of the hyposulphite of soda. Cyanide of potassium is a more powerful cleansing agent but is very poisonous. In cleaning gilded ware, different processes must be used for articles gilded by fire or by the galvanic process, and articles gilded by gold leaf, such as frames, etc. For cleaning articles gilded by the first-named methods, one part of borax is dissolved in sixteen parts of water. With this solution the article is carefully rubbed by means of a soft sponge or brush, then rinsed with water, and finally dried with a linen rag, or if small, such as a piece of jewelry, with boxwood sawdust. If at all convenient, the article is warmed previous to being rubbed, by which means the brilliancy of it is greatly increased. In cleaning gilded frames of the last named order, pure water only must be employed, and the rubbing off of the impurities must take place by means of a very slight pressure. Wares of imitation gilt are generally covered with a shellac or resin varnish, which would be dissolved by the application of soap water, alkaline solutions, or spirits of wine. Were the varnish rubbed off, the exceedingly thin layer of gold or silver leaf beneath would also disappear. In our experience we have seen hundreds of once valuable but now worthless frames, they having become thus simply by the application of soap water.

TRACINGS ON GLASS FOR LANTERNS.—The following method, by George Smith, appears to be satisfactory. A piece of finely ground glass is rubbed over with a trace of glycerine, in order to make it as transparent as possible. It is now easy to write or draw on the prepared surface with a hard and finely pointed black-lead pencil, and the glass is so transparent that the finest details of any engraving over which it may be placed can be seen quite distinctly. The drawing having been finished, the plate is washed with water, in order to remove the glycerine, and dried. A thin coat of Canada balsam or of negative varnish now serves to render the slide permanently transparent and ready for the lantern.

THE EFFECT of a European war on this country, would be to advance the prices of American cotton breadstuffs, iron and other products and to increase the demand for American securities. Already the New York cotton market has felt the influence of the threatened outbreak. Cotton futures have rapidly advanced within a few days. The effect of the interruption of traffic by way of the Suez Canal can be estimated when it is known that in the weekly reports of Indian cotton afloat bound for Europe the amounts given have of late ranged from 360,000 to 400,000 bales—a very important item when the stock at Liverpool is reported 100,000 bales less than on June 9.

The Hennepin canal scheme has undoutedly received a set-back, for the present, at least, and it is doutful if Congress will ever vote to build the canal, which may cost $10,000,000 and may cost ten times as much. Senator Logan who is one of the foremost champions of the canal, considers it dead as far as Congress is concerned.

There are 38 establishments in this country engaged in manufacturing fire-arms, employing a capital of $8,315,280. During the census year these establishments employed 5,491 hands, whose wages aggregated $2,460,089. The materials used were valued at $1,781,326 ard the product at $5,618,606.

There are 38 establishments in this country engaged in manufacturing fire-arms, employing a capital of $8,315,289. During the census year these establishments employed 5,491 hands, whose wages aggregated $2,560,080. The materials used were valued at $1,781,326, and the product at $5,618,636.

Gloucester fishermen are greatly agitated over the proposition to put a steamer into the mackerel fisheries, and to make oil and guano out of the fish.

PRACTICAL MECHANICS.

Flanging Boiler Heads.

The study of the causes and nature of the defect known as grooving, as well as the character and appearance of the fractures which frequently occur in the flanges of heads or tube sheets and other parts of boilers where flanging is done, leads to the conclusion that flanges, as ordinarily turned, are very much too sharp, or turned to too short a radius. The evil effect upon iron of bending it too sharply may be shown by a diagram which represents a full size section of a tube sheet at the angle or flange, bent to a radius equal to about the thickness of the plate, as frequently found in practice. Indeed the sheets are frequently found with a still shorter bend, sometimes almost a sharp corner on the inside. The effect of this is to unduly strain the iron, both on the outside and inside of the flange, the outside being under a combined tensile and bending strain generally to such an extent that a section of the flange shows a laminated appearance, caused by the layers of the plate being separated and sliding upon each other, while the outside of the plate, unless of extra fine iron worked with more skill than is usual, if examined closely, will be found to be filled with small cracks having the appearance of season checks, as seen in timber. The inside of the flange, on the contrary, is in a state of undue compression, the fibers being crushed and buckled up. The effect of too sharp flanging may easily be shown; by taking a narrow strip of boiler plate and bending it sharply the effect will be very marked. This disturbance of the fibers and laminæ of the iron renders it partinularly susceptible to the corrosive action of the acid present to a greater or less extent in all waters, the result being manifested by grooving or channeling and fracture along the angle of the flange, caused by the combined action of grooving and the "working" caused by variations of pressure and contraction and expansion.

Process of Tinning.

Tin, though of no great practical use by itself, is admirably adapted for coating other metals and protecting them against the evil effects of oxidation. The four principal methods of plating, says IRON, are by the contact of molten tin with a scaled surface. by amalgamation, by immersion, and by the galvanic battery. In the first process, which is that more generally employed, the metal, well scaled with diluted sulphuric or hydrochloric acid, is raised to the temperature of the melting point of tin. It is then sprinkled with powdered rosin and plunged in a bath of metal, the surface of which is covered with rosin for preventing oxidation. Great skill is required in this operation, which succeeds equally well with iron, brass and copper. In the process of amalgamation, which is rapidly falling into disuse, a thin layer of a soft amalgam of tin with mercury is applied to the perfectly clean and dry surface to be covered; on heating, the mercury is driven off and the tin adheres. In tinning by immersion, the parts to be tinned, well cleaned, are plunged into one of the following liquors, raised to boiling point:

Ammoniacal alum	535	or	Bitartrate of potash	435
Boiling water	4600		Water	870
Protochlorate of tin	31		Protochlorate of tin	31

In the latter case, an ignot of pure zinc is immersed in the bath at the same time. In tinning with the battery, tbe following bath is prepared:

	Parts.
Pyrophosphate of potash	400
Protochlorate of tin	150
Water	650

At the positive pole is an ignot of pure Banca tin, and at the negative an ingot of zinc. The following method has been recommended by Weigler: A bath is prepared by introducting chlorine into a concentrated solution of chlorate of tin until it is saturated with this gas. The excess of chlorine is driven off bv heating the solution, diluted with ten times its volume of filtered water. The articles to be tinned, scaled with dilute acid, polished with fine sand and rinsed, are suspended with zinc wires in the bath, connected with the battery, for 10 or 15 minutes. The disadvantages of this process are that the bath soon becomes charged with chlorate of zinc, and the tin salt requires frequent renewal. Hern proposes the following bath, in which the metals to be coated are to be immersed: Tartaric acid, 62 grams, (2 oz. 3 dr.); water, 3 liters (2½ quarts); soda, 90 grms. (3 oz. 3 dr.); protochlorate of tin, 90 grms. (3 oz. 3 dr.)

Boilers.

The following is a portion of the report of the Committee on Boilers of the Railway Master Mechanics' Association. As regards material in the construction of boilers, the use of the best quality of homogeneous steel as now made by our manufacturers leaves little to be desired. Notwithstanding its excellent quality, we are not entirely free from ruptured side-sheets in the larger class of locomotive boilers, where the box is deep and water used such as deposits a hard scale on the sheets. The fault in most cases of failure is not with the material, but rather that it is required to stand what in the nature of things may be said to be impossible—strains from compression and elongation beyond the elastic limit, without final rupture. The formation of the sheet increases the expansion of the metal by allowing it to attain a higher degree of temperature than it otherwise would, developing strains in the sheet that sometimes produce a permanent elongation or shortening, as the case may be, in a comparatively small section, and when the temperature becomes uniform in all parts of the sheet, the part under tensile strength is liable to rupture, beginning always at a stay-bolt hole, but extending through the sheet between the stay-bolts as likely, when once started, as from one hole to another. The character of water used in a boiler as regards the deposits left in it from evaporation determine to a great extent the durability of the fire-box and tube ends. Yet with the best quality of water a fire-box has its day. It perishes, however, from a different disorder than the one in a boiler supplied with water that deposits a heavy scale. In the former case the flanges of the flue sheets and the back sheet from the top of the grate to about 36 inches up are the points that ordinarily give out first. The flanges become overheated or burned and crack from the rivet out, and the cracks gape open and leak. The sheets also become thin at the corners below the grate from corrosion, while in its other parts the fire-box remains sound. In the latter case the life of the fire-box is too short for producing this effect on the flanges of flue and back sheets, as the side sheets give out at the stay-bolts from cracks extending from them to a greater or less distance, until renewal becomes necessary.

It is important in all cases that the flanges of fire-box sheets be as short as possible. The closer the seam is to the corner the longer it will last. It remains cooler than if more exposed to the effects of the fire. I have noticed a number of flue and back sheets within the past two years that had to be removed simply on account of the burning and cracking of their flanges, that were otherwise good for several years' service, and many more that must soon be removed from the same cause. The flanges were originally made too long, extending out from the face of the sheet as much as three inches. Had they been but two inches they would doubtless have lasted much longer. This is a matter which from my observation we conclude is very often overlooked in the construction of the fire-box. All laps exposed to the fire should be as short as possible, more particularly where the heat is great. The flanges if properly turned need not at most be more than two inches from the face of the sheet in the vertical seams for a distance of two or three feet above the grate. A lap of 1¾ inches for the seam is sufficient at that place. At greater distances from the grate. the lap and length of flange may be greater without any evil results.

We have noticed many cases also where tube sheets were much worn around the end of the tube in the form of a counter sink, about one fourth of an inch wide and the same in depth. Around the lower and central tubes the sheets become so thin as to require removal, while at all other parts they were apparently good. Such sheets were in nearly or quite every case in fire-boxes of engines doing heavy work and having boilers comparatively small for their cylinders and work, In the case of copper tube sheets this defect seems to be greater even than with steel sheets. The cause of this cutting away of the sheet in the form of a groove around the tube end is due, we suppose, to the particles of coal and cinder drawn toward the tube by the force of the draft, and those striking the outer slope of the head on the end of the tube, where it projects into the fire box, turn outward toward or from the tube, striking the sheet and in time cutting a groove or valley around the end of the tube as stated, while the projecting end of the tube itself suffers comparatively little— the action of

these particles of coal and cinders on the sheet around the tube being the same as that of sand in the sand-blast machine for sharpening files. If this theory is correct, then it will be best to have as little projection on the tube end as possible beyond the face of the sheet in the fire-box. To countersink the tube-hole sufficiently to receive the head or flange on the end of the tube without leaving a sloping projection on its outer edge will add to the life of the sheet.

SCIENCE AND INVENTION.

MIXTURE OF GASES BY DIFUSION.

THE fact that gases do not mix very rapidly by diffusion alone may be strikingly illustrated by placing a strip of white paper, moistened with acetate of lead solution, inside a tall glass stoppered cylinder, so that when the latter is inverted the paper extends from the bottom (which now forms the upper end) not more than one-third of the total length of the cylinder. A solution of sulphurreted hydrogen in water is then placed in the hollow stopper of the cylinder, and the stopper is inserted loosely into its place. After about 10 or 15 minutes the production of sulphide of lead on the white paper shows that the sulphureted hydrogen has risen two-thirds of the height of the cylinder. Papers moistened with starch, iodide of potassium and chlorine water may respectively replace the lead acetate paper and the sulphureted hyrdogen water.

KABAMH'S ACCUMULATORS.

Mr. Nicholas de Kabath, of Paris, has brought out an accumulator, which is designed to give a very large accumulating surface. It consists of a number of plates, connected alternately like the plates of a condenser. Each plate is composed of a set of strips of lead, 1-10th mm. thick. These slips are alternately flat and corrugated, and are placed so as to form a plate 8 or 9 mm. wide, built up of about 100 slips. They are kept together by perforated lead plate, entirely surrounding them, but permitting a free circulation of the liquid. In forming a cell of the accumulator, Mr. De Kabath puts 12 of these plates into a water-tight wooden case having two terminals, and connects the alternate plates to the terminals. The end plates are plain sheets of lead, thus making 14 in all. The plates are fixed at top to the wooden cover, and rest at the bottom in a bed of black rosin and parafine. The cells are charged with sulphuric acid, like M. Plante's secondary battery.

MAGNETIZATION BY HEAT.

MR. Kepner, of Salzburg, in Tyrol, recently observed that some old bricks affected the magnetic needle, and in order to investigate the cause of this phenomenon he had two bricks made from the eight varieties of clay in the neighborhood, one brick in each case being baked. It was found that the unbaked bricks did not affect the needle. Seven out of the eight baked bricks, however, proved polarly magnetic. In further experiments by Messrs. Kell & Triente, it was found that particles of powder on the magnetic bricks adhered to the steel magnet. Breunerite, mica-slate, argillaceous iron garnet, chlorite and hornblende were, before heating, unmagnetic, but intense heating produced a magnetic polarity, the axis of which seemed to be perpendicular to the plane of stratification.

PRESERVATION OF WOOD.

THE increasing cost of wood in this country has led to a great number of experiments in preserving from decay all kinds of wooden structures exposed to the weather. Among the more recent plans suggested is one for impregnating wood with asphalt, combined with some anticeptic material. The finished wood, ready to be put together, is first submitted to heat to drive out the moisture, and is then placed in a hot bath composed chiefly of asphalt and carbolic acid. On cooling, the solvent of the asphalt evaporates, leaving a skin or coating of the asphalt on the surface of the wood that resists water and keeps the antiseptic material securely locked within the pores of the wood. The exterior of the wood presents a smooth, black surface that does not need to be painted.

A NEW WEATHER INDICATOR.

CONSIDERING that a fall of the barometer in general indicates coming rain only when the moisture increases at the same time, Herr Klingerfues, of Gottingen, has devised a combination of the barometer and the hygrometer. The horizontal axis of a rotating index has two supports behind, and between these a short piece projecting in an opposite direction to that of the index, which is more or less oblique. Over this piece passes a thin, soft cord of hygroscopic fibres (e.g.; of human hair deprived of grease), reaching from the outer support to the middle of the corrugated plate of an aneroid case. It will be understood that when the air-pressure increases, the cord is stretched and the index rises. But, if the moisture increases, the cord slackens and the index falls.

RAISING STAMP HEADS.

According to the invention of Mr. S. Jellyman, a Canadian, the raising of stamp-heads can be effected by employing an iron or steel band passing over a pulley, and operated upon by means of a small roller attached to the main shaft. The pulley is hung from the latter by side straps connected by two metal straps with a forked lengthening screw, thus insuring a direct pull from the main shaft upon the operating roller. This roller is mounted on an eccentric shaft which is operated upon by levers, and a catch is employed to hold up the stamp or drop hammer. This catch consists of a bar of metal suspended at one end, and provided with an oblong slot. The bar hangs in a slightly inclined position, and the band to which the stamp or drop-head is attached, passes through the slot above mentioned. Small steel pawls may be fixed in one or both ends of the slot to insure a firmer grip.

NEW BLOW-PIPES.

A blowpipe has been patented in Germany by Schlag and Berend, of Berlin, in which the air blown into the mouthpiece passes through a valve into a caoutchouc bag, which is inclosed in the tube and serves as regulator of the issuing air, in the case of intermittent blowing. The valve prevents return of the air forced in.

AN ELECTRIC BELL CORD.

A novel invention had its first test on a Union Pacific train lately. It is an electric bell-cord which conveys signals to the engineer's cab by a mere touch. It can be attached to a freight train, where it would give the alarm to both engineer and conductor should the train break, thus enabling them to prevent serious accidents from such causes. The invention is the work of a telegraph line repairer on that road.

NOVEL LUBRICATION FOR WIRE.

It is said that if iron or steel wire is immersed in a hot solution of common salt, and is allowed to remain until the temperature is the same as that of the solution, the crystals will adhere to the surface with such tenacity as to form an almost perfect lubrication for future drawing. The practice of using brine, or salt and water, on hot journals is an old-time one the result being good when they are hot, (not warm). The effect in both instances is probably identical.

The Iron Trade.

The following is from the the forth-coming report of the conditions and prospects of the iron trade by Mr. Jas. M. Swank, Secretary of the American Iron and Steel Association. Prices were generally higher the close of the year than at its beginning. Yet there were not wanting indications in December that a decreased demand and lower prices might be expected. There had been a flurry in railroad stocks resulting from over speculation, short crops, a shrinkage in freights and reduced rates, and clearly pointing to greater caution in the immediate future in railroad investments. This flurry was significant of an early decline in the demand for rails and other railroad materials for new roads, while the short crops and the consequent shrinkage in freight and struggle for freight tariff were equally significant of an early spasm of economy in the purchase of rails and other materials for existing roads. These indications of a decreased demand for railroad supplies became manifest too, at the moment when it became generally recognized that the ability of the country to supply itself with steel rails had been greatly increased. The elements of weakness in steel rails were plainly visible; and as steel rails had been largely instrumental in holding up the prices of other iron and steel products, it was clearly to be inferred that when they should decline in price, the market would weaken at almost every point, from this cause alone, if from no other. The indications of last December have been only too fully verified. The demand for most iron and steel products has sensibly slackened, and prices have generally sympathized with this decline. Steel rails especialy have experienced a remarkable fall in price. At the middle of December they were quoted at $60, while the price at the end of the month was $58. At the middle of May, orders were easily placed at $50, a decline of $10 in five months. Iron rails were quoted at $48 at the close of December, and in May they had fallen to $44. Pig iron fell about one dollar and a half per ton from December to May except for best brands of No. 1 anthracite foundry. The prices of bar iron and nails have recently symyathized with the downward tendency in the prices of the other articles above named. In December the price of bar iron at the stores in Philadelphia was 2.9 cents, aud at the midde of May it was 2.6 cents. The quoted prices of nails at Pittsburg in December was $3.30 per keg, and at the middle of May was $3.

Of the demand for all iron and steel products in Hay when this report is written, it is certainly correct to say that it is not satisfactory. The situation at the present moment is far from encouragging and in some respects is discouraging. The heavy importations of iron and steel that have been made since the beginning of the year exercise an unfavorable influence upon the market. Pig iron and iron and steel rails have been brought into the country in large quantities at a time when we are abundantly able to supply the home demand from our own works. The floods in the Mississippi and the cold and wet spring have had an unfavorable effect on all business. The shortness of the harvest last year has increased the cost of the necessaries of life and labor is consequently unwilling to accept any reduction in its wages, in some instances it even demands higher wages. Through a decline in our exports of agricultural products the balance of trade is being rapidly turned against us, which means less buoyancy and ease in the general financial situation. The whole trade of the country with which, of course, the iron trade must sympathize, is now undergoing a moderate reaction from the remarkable activity of the last three years. Such are the influences that affect unfavorably the American iron trade to day. We may hope, however, that the prevailing low prices of iron and steel will ere long, especially if we should have a favorable harvest, infuse greater activity than now exists into all branches of our iron and steel industries. But under no circumstances that can possibly happen will this year's business be as prosperous as that of last year.

The fact may as well be accepted philosophically, if reluctantly, that we have again entered upon a cycle of low prices for iron and steel. We do not think this result is greatly to be regretted if we consider that some remedy is needed to check our enormous importations of these articles. Were these importations to be continued for a few years longer, upon the scale which has existed during the past three years, our iron and steel industries would suffer the most serious consequences, which would be felt for a generation. Iron and steel are not consumed like bread nor worn out like clothing. Every ton of these metals that is imported stays here and permanently displaces a ton of the same product that might be made at home. Even when iron and steel "wear out" in one form they re-appear in another. As a matter of fact, however, the iron and steel rails and some other iron and steel articles that have recently been imported will last a long time in their present forms. Importations of iron and steel have, therefore, to be checked in some way if we would not prevent the future prosperity of the domestic producers of these articles. Low prices may be a distasteful remedy for our manufacturers and their workmen, and for iron ore producers, to apply to the evil mentioned, but no other remedy is available. It is a pity that good use was not made of it a few months ago.

PRIVATE TELEGRAPHIC WIRES.—The cost of a private wire from New York to Philadelphia is $2,500 a year, the company furnishing nothing but the wire and the instruments at both ends of the line. To Boston it is $4,500 a year. The expense of an operator at each end adds about $1,500 a year to the total cost. There is a saving of money to those concerns doing a large business, but the chief advantage is in the saving of time, especially to stock brokers, as minutes on the stock exchange sometimes represent fortunes.

Chattanooga, Tenn., is to have a seventy-five thousand dollar plow factory.

RAILROADS.

The Chicago RAILWAY AGE states that in the first six months of 1882 the track has been laid on at least 179 lines in 37 States and Territories, adding a mileage of main track aggregating no less than 4,990, or in round numbers 5,000 miles! It remarks: It must be remembered that these figures show only the main track and do not include sidings and second, third and fourth tracks, of which hundreds of miles have been laid. Our table for the first five months of the year showed 120 roads with 3,480 miles of new track, so that the present table for six months gives an addition of 59 roads and 1,510 miles of track. This increase, however, is not all to be credited to June, but is in part the result of more complete returns to us for the full period. How extraordinary has been the work of the past season in comparison with its predecessors may be seen by the fact that while it shows nearly 5,000 miles of new road, the aggregate reported for the same period last year was only a little over 2,000 miles, and during the same period of no previous year has it equalled even that amount.

The Ohio Southern Company has completed and opened for business a branch from Jackson, O., the easterly terminus of the road, northeast of Wellston, ten miles. It is built to reach coal mines on the line.

Track on the Cincinnati, Van Wert & Michigan Railroad is laid from Pleasant Point, O., north to Paulding, six miles. Grading is is in progress between Shane's Crossing and Greenville, forty-four miles. There are now thirty-two miles completed from Shane's Crossing, Mercer county, north through Van Wert to Paulding.

The report of the Cincinnati, Indianapolis, St. Louis & Chicago Company for the year ending June 30, June being estimated, shows the gross earnings to be $5,520,000; expenses, $1,473,000; interest, taxes, and rental, $632,000; leaving a net profit of $415,000. A dividend of 1½ per cent. has been declared, payable July 15. The stockholders have ratified the action of the directors increasing the capital stock $1,000,000.

The minority report of the Congressional Committee on the Northern Pacific land grants is very severe, and smacks of "anti-monopolist" influence. It figures that the road has already earned land enough at $3.50 per acre to pay for the entire cost of constructing the whole system, and leave a bonus of $8,000,000 for the company. Besides it thinks that the company should be satisfied with this. If the entire grant is to be declared non-forfeitable, it figures that the road will receieve land worth $144,000,000, while its cost is only $75,000,000, thus paying the entire cost, and getting a bonus of nearly $70,000,000 besides. It recommends, therefore, that all land not earned on January 1, 1882, be forfeited to the United States.

Valley Railway, O., stock is quoted at 15 to 18; bonds from $1.00 to $1.03. Work is progressing rapidly on the Valley extension. The track is laid to Mineral Point.

Lake Shore half-yearly statement, June being partially estimated, shows gross earnings to the amount of $8,026,200, against $8,954,926 for the corresponding period of 1881. Operating expenses and taxes aggregating $5,403,791, against $5,275,164 in the first six months of 1881, making the net earning $2,622,409, against $3,669,762 in the 1881 term. Interest, rentals and dividends on guaranteed stocks amounted to $1,500,000 against $1,363,000 in the first six months of 1881, thus leaving a balance for the half year covered by the report of $1,122,409, in contrast with $2,307,762, the balance in the first six months of 1881.

NOISE IN STEAM PIPES.—The primary cause of the loud hammering noises that are often so annoying to occupants of apartments heated by steam pipes, is the condensation of steam in the system of pipes. When the steam is first turned on, it takes some time for the pipes to become thoroughly heated, and the steam in contact with the cold metallic surfaces condenses. This water of condensation is further cooled off by contact with the metal and in turn condenses the steam immediately in its vicinity with more or less suddenness. The pressure being thus removed from one side of the water column, the body of water driven by the elastic force of the air behind it, violently into the space occupied by the condensed steam, and, striking against the bends of the coil or valves, causes the cracking or hammering noise referred to. The water body is again driven forward by the steam, and it again condenses it, and the knocking is repeated, the blows often succeeding each other with great rapidity. Or some of the steam after admission may become shut off by the condensation between the two bodies of water, and the noise will then be caused by the violent impact of the two bodies of water rushing together to fill the vacuum. The familiar experiment of the "water hammer" will explain how, in the absence of any resisting body like air or other elastic body, a mass of water will strike a resisting surface with all the effect of a solid body. On account of the inconvenience experienced from this cause, provision is always sought to be made in steam heating apparatus to provide for drawing off the water of condensation in traps, thus removing it from the pipes and coils as rapidly as it accumulates. When the steam is shut off, the condensation of the residual steam in the pipes and coils may produce the same hammering noise, though to a less degree than immediately after its admission.

REVIEWS.

Conversations on the Principal Subjects of Political Economy. By WILLIAM ELDER, author of Questions of the Day Economic and Social. Philadelphia. Henry Carey Bowen & Co., Industrial Publishers, 810 Walnut street, 1882.

This work in our judgment takes the lead in treatises of its kind, and is as far removed as light from darkness from theoretical and dogmatical works under this heading which perplexed and bewildered the readers of a past generation. The work teems with facts drawn from authoritative sources, and throughout the deduetive method is followed. There is no groping for principles; these are clearly presented and fully expounded. Here may be found an ample exposition of the sources of wealth, and the influences that operate to create and distribute it. Even the transitions effected through industry and science of one material into another are noted as tributary forces adding to value. Having discussed the sources of wealth the laws of population, and the capability of the earth to supply sustenance to the population, he deals largely with labor, profit and interest, recognizing as to labor, that it and capital are not on a see-saw playing on a forced lever or fulcrum but are jointly concerned in creating new value which should be equitably distributed. That effective remuneration of labor must follow the accumulation of the general wealth, he regards as obvious from the immense expansion of the market for commodities. Money and prices, the standard of value and the system of banking organization are most lucidly expounded. A portion of this work that will attract attention is that illustrative of the improvement of the condition of the working classes, indicating an advance in what Mr. Elder designates "service worth." We extract the following illustration:

"The wages of bricklayers, masons, and carpenters, at Greenwich, in England, (from 1735 to 1835) doubled in money price from 2s. 6d. to 5s. per diem. According to William Penn's cash book, to earn one ton of flour required the unskilled labor of 137 days; in 1834, 135 years after, the like labor earned the price of one ton of flour in seventy-eight days. In France in the year 1700 the annual wages of a family of four and a half persons is given by competent staticians at the then price of twenty one bushels or wheat—in 1840 at sixty bushels. In that period of 140 years agricultural products of every kind quadrupled. The population was not nearly doubled. The weekly wages of women in domestic service in the United States averaged 62½ cents in the year 1814; in 1860 they rose to $1.75, and now in 1880, they range from $2 to $3 in money."

The increase in the purchasing power of money is very clearly shown through a period of forty-six years. Of course the purchasing power is at times subject to violent fluctuations as we have witnessed in the past few years, and we may be permitted to doubt whether its value has not reached the maximum. The activity of production would appear to be unable to cope with the increased wants of the masses; the vast annual production of gold and silver mines and the substitutes for coin in our financial organiziations, all aid in enhancing prices.

The subject of international trade is very ably dealt with. Mr. Elder points out the benefits which the Zolverein has conferred on Germany and argues that industrial protection is the parent of the German empire. "Under a protective system," he remarks, "Germany grew out of its infancy in manufacturing arts, to a maturity which has made an empire out of the previously existing fragments of nationalities." He adds: "No civilized people have risen to independence wealth and power, while neglecting the protection of their industries, and we know that since the inauguration of the chemical and mechanical auxiliaries in industrial production no nation that held a high rank two or three hundred years ago, and has abandoned its manufacturing industries to haphazard or free trade, has been able to maintain equality with those to whom it has surrendered the management of its labor and productive capabilities. England began her system of restriction and prohibition of foreign trade in 1838 under Edward III., and she persisted in it systematically and resolutely for more than five centuries—till 1845." The benefits of protection to all our leading industries and all classes of people are expounded, the author's views being supported by the facts and figures he arrays, but these we must refer to the work itself, the information in which has not only been laboriously but intelligently collated, and is presented clearly and vividly. We advise all our readers to purchase this exposition of political economy.

Several Pittsburgh Furnacemen are endeavoring to lease a large tract of limestone property situate near Ursina on the B. & O. railroad, and owned by the Connellsville and Ursina Coal and Coke Company.

The number of roads on which additional track was laid in Ohio in the first six months of 1882 was ten and the number of miles constructed was 238.

MINES AND MINING.

Wages in the Schuylkill region are being paid at three per cent. below the $2.50 basis.

Georgia's State geologist says, the gold mines of that State yield 250 per cent. on the capital invested.

The mines at Portage, Cambria county Pa., are reaping a harvest from the idleness in the Clearfield and Cumberland districts.

The Scott Haven mines, on the Baltimore and Ohio Railroad, are running steady at 3½ cents per bushel, with over 200 miners at work.

A seam of coal four feet thick yields a ton of coal to every square yard. At this rate an acre would contain about 5,000 tons, and a square mile 3,200,000 tons.

The Tamarack shaft, near the Calumet and Hecla, has reached a depth of 180 feet, and has passed through several "leaders," indicating an approach to mineral bearing ground.

At Martinsburg, Blair County, Pa., there has been struck a seventeen-foot vein of iron ore, the output of which is being shipped to the Pennsylvania Steel Works, near Harrisburg.

Speaking of the Ludington iron mine, the Menominee Range says: That the new discovery of the Ludington is the biggest thing that has been found on the range. Shipments have commenced.

The mines in the Hocking and Tuscarawas Valleys, Ohio, are generally running, but the reports from them are not encouraging for steady work. Some of the mines that have lake orders are doing fairly.

Captain L. Bremond is superintendent of the C. & O. coal docks at Newport News. He has practically succeeded in 'sending coals to Newcastle.' The British steamer Merca of and for Newcastle, England, recently took on 400 tons of New River steam coal.

The Delaware, Lackawanna and Western Railroad Company are now prepared to load the highest propeller on the lakes. They have tapped their coal pockets about half way up and have temporary spouts made which are used until the boat is low enough to work for regular spouts.

Everything is quiet in the Clearfield coal region. All the collieries with two or three exceptions are working with reduced force. It is believed sufficient coal will be produced to supply current requirements. The operatives in the Snowshoe region, numbering about one thousand have resolved not to strike.

The promising discoveries of coal in Iowa have been followed by not less promising discoveries of iron ore. A large deposit, covering more than four hundred acres, and having a depth of two hundred feet or more, is reported in the Lansing Ridge Allamakee county, about eighty miles north of Dubuque.

The Jellico Mountain (Tennessee) Mining Company have developed a vein of coal over five feet in thickness. Their mines are said to be unsurpassed in richness, and contain four different qualities of coal. The completion of the Knoxville branch of the Louisville and Nashville Railroad will enable the company to put their coal into the market.

A wonderful discovery of native copper and silver is said to have been made some seventeen miles southeast of Laramie City, Wyoming Territory. The vein bearing the ore yielding from 60 to 100 per cent. of copper, with gold and silver in paying quantities, runs directly across the old overland stage road, and has been traveled over for years.

The mine and coke works of the Waverly Coal and Coke Company at Smithton, Pa., which were recently leased and taken posession of by Messrs. Rafferty & Haggerty, well known coke manufacturers, are in full operation, employing between 250 and 300 men. They have 117 coke ovens in blast, and ship about 30 cars daily. The coal averages about six feet, the miners working on a sliding scale based on the selling price of coal.

A writer in the New York Tribune, who has been looking over the oil regions says: "Since the first oil well was opened in 1859 the product of the wells has added $1,500,000,000 to the wealth of the United States in the value of the crude oil and its products. Today the products of these wells lights the cathedrals of Europe, the mosques of Asia, the pagodas of Japan and even the huts on Africa's sunny soil. It exports are over one million gallons a day. In 1881 the value of the exports of petroleum and its products was $40,315,609, which was greater than that of tobacco, woodenware, iron and steel manufacturers, or live animals, and second only to cotton and cereals.

A correspondent in Northern California describes the hydraulic mining operations of the North Bloomfield. The mine's water supply is derived from an artificial lake of 550 acres, having a capacity of storing 950,000,000 cubic feet of water, retained by a dam which cost $150,000. The water which passes through these monitors in twenty-four hours is 50 per cent. more than the total water supply for the city of San Francisco in the same length of time. Each monitor throws a stream of water eight inches in diameter, supplied by an 18-inch pipe under a 400 foot pressure. One stream was directed against a bowlder weighing between three or four tons, and the bowlder was thrown a distance of 30 feet. Rocks weighing five pounds were thrown against the stream and they were thrown off as if they had struck a fly wheel in motion. One of these streams would level a brick building in a few minutes, yet they are controlled by a slight touch of the hand. The nozzle is of iron and is the size of a large cannon. The end of the nozzle can be turned up or down and to the right or left by a lever. This turns the entire cannon like nozzle, on the principle that a rudder turns a ship.

Bringing down coal with lime cartridges is attracting much attention in England. It appears from recent experiments that 140 tons more coal were mined with 100 hours less labor by the use of the lime patent than by wedging. The freedom from disastrous explosions of firedamp is perhaps the chief merit of the new process here mentioned, and is certainly the claim which, of all others, its inventors put forward with the greatest pride. The universal adoption of the process, combined with the introduction of a more perfect safety lamp, will undoubtedly diminish the number of accidents in mines by an appreciable amount, and will enable the coal miner to carry on his trade with practically the same safety as pertains to other occupations. The Colliery Guardian observes: "During last week a series of interesting experiments were made at the Alexandria Pit, belonging to the Wigan Coal and Iron Company, with the new system of blasting with caustic lime cartridges. Trials were made in the Pemberton four foot seam on Tuesday. The coal, which is of a particularly hard nature, is worked on the pillar system, and was therefore, admirably adapted for the capabilities of lime as a substistute for gunpowder.

Hazleton, in his article read before the Ohio Institute of Mining Engineers observed in reference to oil: On this subject I had expected to write extensively, but for want of time have not had the various oils in use analyzed, and the result of my experiments with them. Lard oil, since the latest improved lamps were introduced in mines, gives a clear, bright light and makes but little smoke; it can be burned in places where the air is weak without injury to the miner. During the panic when wages were low and work scarce, anything that was cheap and would answer at all was sought after. It was then that the miners oil was used and various other cheap and worthless oils were introduced into the market on account of their trifling cost. They burn as if composed of some heavy, gummy oil such as cotton seed mixed petroleum, and the difference of the various brands consists in the proportion in which the mixture is made. One having more petroleum and less cottonseed, the other more cottonseed and less petroleum. Which is the least objectionable depends on the strength and hardihood and taste of the miner. At many mines the miner is expected to buy oil from the employer and then it is "die dog or eat the hatchet." Any of them give off a very oppressive odor, burn up quickly with great smoke, and to a person working in an entry or any place ahead of the air is very injurious, as it is choking and pollutes the already scanty supply of air and renders it unwholesome, inflaming the throat and eyelids in a very short time. To a mining engineer, who has the lamp under his nose, it is especially injurious and I suffer more from inflamation of the eyes than any other thing, which is caused by the poisonous air given off by this manufactured oil, which, if left in a lamp two or three days will gum it up so that it can scarcely be opened and will not burn at all without putting in a new wick, after first thoroughly cleaning it out, the old one being the color, and feeling very much like beeswax, the smell being very sickening. When not so corroded as not to burn cannot help but be very unhealthy to the person who inhales the smoke, which all who are employed underground must do more or less. This subject should be a part of the mining law of every State and I call the attention of our Worthy President to the subject.

The peculiar results arising from the liberation of large quantities of gases in mines are among the most irregular phenomena met with in mining. We frequently hear of their effects, but there are no reliable data as to the cause of the many heavy and sudden issues that occur, It is known that the movement of the column of the barometer was the effect of a cause which must precede such movements, that cause being an increase or decrease of pressure in the atmosphere; and upon the pent up gas in coal seams we are taught to believe that pressure plays an all important part, so that, when the barometer is high. the gas is forced back into the pores and fisures of the coal, and when the barometer is low, the gas issues in large quantities. But the depression or rise of an inch rarely takes place in a short space of time. Yet without the slightest indication, a vast volume of gas will escape, filling the working places for a considerable length with gas, which mixing with the air, however large the quantity, renders it in the highest degree explosive. When a sudden discharge takes place, it is sometimes preceded with little noise; at other times there will be a trembling of the floor; it will then heave up; there will be a loud report—probably the rock breaking above. In nearly all cases there is a heaving of the floor and a swaying of the roof, so that the two sometimes meet. The probable cause of the explosions seems to be that hollows in the strata immediately above the coal measures were filled with gas given off by the coal, where it was stored up under great pressure, until in the course of the sinking the walls of a principal reservoir were so much attenuated as to give way explosively, and after this first burst the gas continued to escape for several months through the ground loosened by tho first blast. Here the gas was not inflammable, and consequently incapable of causing an explosive mixture, but was comparable to the bursting of a boiler or air receiver under excessive strain. These sudden issues of the vast quantities of gas are the most dangerous elements to be encountered in a mine, and it would be advisable to have their cause investigated. Engineers and chemists know the effects as before stated, but are not aware of the actual cause. The gas is pent up, and suddenly oozes out in large volumes without any previous indication. As we do not know how such issues are to be anticipated, or the place they are likely to come from fixed upon, all that can be done when they take place is to open out the part, so that there is plenty of vent for the escape of the gas.

MARKETS.

Office of TRADE REVIEW AND WESTERN MACHINIST.

FRIDAY EVENING, July 21.

FINANCIAL.

The week has shown improvement in general business; the crop news is encouraging; affairs in Europe promise a larger demand for American products; prices of grain and provisions have declined, and the banks have increased their reserves. There has been more activity in local money circles, there being an increase in the applications for discounts, freely met at the customary rate of 7@5 per cent. On prime collaterals money is obtained at 6 per cent. on specific time, and 5 per cent. on call. Foreign exchange is a little firmer, with a wider difference between short and long sterling bills, in anticipation that the Bank of England will advance its rate of disconnt. Prime local bankers' three days sight sells at 488½@489, and 60 day bills at 485½ Dealers buy commercial bills at 483@483½ per £. Local securities have been in more active demand and the market is a little stronger.

NEW YORK.—Call loans range from 5@6 per cent; discounts are 5@5½. The general advance in the prices of stocks last week is maintained. There is a belief that the earnings of the railroads, especially the western roads, are going to be very large.

IRON ORE.

The chronic condition of the iron ore trade continues, and there is little inquiry. Operators are awaiting the issue of the strike on which hinges the question whether there will be a good or an indifferent Fall trade. There have been considerable receipts the past week, with shipments amounting to about one-third.

IRON.

Business in the iron trade is improving, and the assurance of steadiness in rates encourages buyers Deliveries on back orders have been heavy. Much depends on the issue of the strikers as to the future condition of trade. We quote Foundry No. 1, X, $25@26; Foundry No. 2 X, $23@24; Gray Forge, $22. Transactions in foreign iron have been limited, and the importations slight. The demand has been almost wholly of a jobbing character We quote Coltness, $26 50 to $27; Glengarnock, $24 to $24.50; Garsherrie, $2 50 to $26; Summerlee, $25.50 to $26; Carnbroe, $23 to $23.50; Eglinton $22.50 from dock, and $23 from yard; Langloan, $25 75 to arrive. There is no change in the situation of American steel; some thousands of tons of which have changed hands; mill agents quote $45@$50 for prompt or near-by delivery, but there is unwillingness to name a price for any delivery after Autumn. Iron rails are almost wholly nominal, the only business being in small lots, say $44@$47.50, according to weight. Old rails are dull and quotably unchanged. Tees held at $27.50@$28, but no fresh business has transpired. Sheet iron is scarce for prompt delivery. The requirements for all kinds of sheet are increasing, and a further advance is said to be probable for early delivery. For wrought iron pipe there is only a moderate business, but with a light stock and production very much reduced prices are firm. We continue to quote discounts on gas and steam pipe 60 to 62½ per cent.; on boiler tubes 42½ to 45 per cent. Oil well casing 65 to 67½ cents per foot net; do tubing 20c.

CINCINNATI--(Reported by Rogers, Brown & Co.) Southern Coke Irons have been marked up another half dollar since last report, and are held firmly at the outside quotations below. Sales are made at the advanced figures and consumers seem as well pleased as makers at the improved tone of the market. No advance is asked yet in Charcoal irons as they are not in so good demand as the Southern Coke kinds. As the majority of sales in this market are now for cash, and the tendency is strongly toward a cash basis of business, we shall quote hereafter cash instead of 4 months prices. The volume of business is fair but not as heavy as in June. We quote for cash: Hot Blast Foundry—Hanging Rock CC. No 1, $26.50@$27.50; No. 2, $25.00@$26 50; Southern, No. 1 $24.00@26.50; Strong Coke, No. 1, $23.50@24.50; No. 2, $22.50@$23 50; No. 3, $21.50@$22.50; Soft Stone coal No. 1, $22.00@23.00; No. 2, $21.00@$22.00. Forge--Strong, Neutral, No. 1. Mill, $21.00@$22.20; Cold Short, No 1 Mill $20.00@21.00. Car Wheel and Malleable--Hanging Rock Cold Blast, $32@34; Hanging Rock Warm Blast, $26@29; Southern Car Wheel Iron $32@36; Lake Superior do. $30@33; Lake Superior Malleable, $30@33.

CINCINNATI—(Reported by E. L. Harper & Co.)—The market has been active throughout the week. The hardening of prices has rendered the conservative buyers more liberal, and orders are being booked freely. The foundries are very active, being generally full of orders, and the mills in operation are working to their fullest capacity. Most of the leading manufacturers of agricultural implements have closed their contracts for the coming season's make, and the magnitude of their orders for Pig Iron indicates their confidence in a greater demand for machines and implements for the season 1882-1883 than has ever been known.

PITTSBURGH.—Transactions in iron are limited. The situation of manufacturers and strikers is unchanged, and so long as the strike continues no improvement is to be looked for. Production has been very much curtailed within the past few weeks, not only here but at all points tributary to this market, furnaces representing a capacity of some 4,000 tons per day having been blown out, hence the stock in first hands is not large, and so far as we can learn there is very little offering, which indicates that furnacemen are able to hold what they have until it is wanted.

COPPER.

There have been few large transactions in Lake ingot, sales of which have been effected at 18¼@18¼. We quote Baltimore at 17½@17¾, and Arizona at 17¾. In a jobbing way Lake commands 18¾c; Baltimore, 17¾c. The combination prices of manufactured copper are unchanged. We quote: Sheathing, 28c; Braziers', 30@32c; Bolt, 30c; copper bottoms, 31@32; American yellow sheathing metal, 20c; y m bolt, 22c; English yellow sheathing metal, 16c. in bond.

TIN AND TIN PLATES.

The continued advance of tin in London, consequent on the complications connected with the Suez canal which may interfere with supplies, has created a feverishness which has had its counterpart here. We quote for round lots: Banca 28 cents; Straits and Malacca 23⅝ to 23¾; Billiton 23¾; Australian 23⅝; English L. & F., 24¼, is quiet, and cokes and charcoal Ternes are easier. We quote: Charcoal bright, $6.50@$6.75; Ternes at $6.00@$8.00; Cokes, $5.50; do Ternes, $5.25@$5.50.

SPELTER AND ZINC.

The market for Spelter is quiet and unchanged at $5 40 for carload lots. The jobbing trade is very quiet at 5¾@6c. Sheet zinc is dull at 7¼@7¾c. in a jobbing way.

HARDWARE.

The demand, which seems entirely of a consumptive character, is well maintained for all descriptions of seasonable articles in hardware, and the outlook for fall business is considered highly encouraging as stocks of builders' hardware and mechanics' tools are unusually light for the season. Nails are in demand and are scarce and firm at $3.50 for 10d. to 60d. Considerable sales have taken place of carpenters' and blacksmiths' tools, also of agricultural implements. New price lists have been issued by a number of leading Eastern manufacturers, showing an advance in certain goods, consequent on increase of labor and raw material. Among others, the manufacturers of cordage have issued a revised list for Manila and Sisal ropes. The demand for foreign hardware is inactive, but values are firm and unchanged.

LUMBER.

Business at the yards has been somewhat inactive. Coarse lumber shows a temporary weakening. Southern pine is in better demand. Hardwoods show a tendency to advance, the feeling being decidedly firmer. A good fall trade at improved prices is confidently anticipated.

WOOL.

The demand for wool has improved. Sales of Ohio have been moderate, and Eastern brokers complain that the bulk of the clip is even poorer than last year. Purchases have been made in this State by leading mills of choice Ohio descriptions at 40c. Latest quotations in the Eastern market are: Ohio XX, 41@43c; do X, 40@42c; do No. 1, 45c.

Cleveland Business Directory.

Assayers and Analytical Chemists.

JUDSON, W. E, Ana ytical Chemist, 8 Cushing Block.

Bolt and Nut Works.

HOTCHKISS & GAYLORD, manuf'rs. Machine, Plow & Elevator Bolts, Coach Screws.

Boiler Makers.

SMITH & TEACHOUT—(Established 1857.) Boiler, Tanks, Stills etc. 429 Broadway.

Bridge Builders.

BUCKEYE BRIDGE AND BOILER WORKS mfrs of Arch & Truss Bridges, Boiler Tanks and Oil Stills. Bet. Wasson St. and Case Ave.

Coal and Iron Exchange.

JACKSON IRON CO. Iron Ore and Pig Iron. Rooms 8 and 9. Fayette Brown, Gen. Agent.

RHODES & CO. Coal, Iron Ore an Pig Iron. Rooms 1 and 2.

Carriage Blacksmith.

STRIEBEL, CHAS. manfac'r. of Carriages and Wagons and platform trucks. Horse shoeing and general blacksmithing .93 Woodland ave.

Carriage Bolts.

THE COLWELL & COLLINS NORWAY BOLT CO., manufacturers of Philadelphia Carriage and Tire Bolts.

Church and School Furniture.

FAULHABER, GEO. manufacturer of School and Church Furniture. Fine Hard Wood work a specialty. 203 Ontario Street.

Custom Boots and Shoes.

ROONEY, JOHN manufacturer of hand-made Boots & Shoes, custom made and warranted 177 Ontario Street.

Carriage Repository.

GREENE'S, J. O., Carriage Repository, 408 Superior street and 52, 54 & 56 Rockwell street, dealer in Fine Carriages. Repair shop in connection.

SLATER, G. A., Carriage dealer, sells the best work for the lowest price. A fine assortment always on hand. Repository 365 Euclid Avenue.

Coal and Pig Iron.

ANDREWS, HITCHCOCK & CO., Briar Hill Coal and Pig Iron. 122 Water Street.

Electrical,

ELECTRIC SUPPLY CO. manfrs and dealers in Electric Burglar Alarms, Anunciators, Cell Bells and Batteries. Telephone lines built and repaired. 145 Seneca Street.

Fresco Artists.

KEMMER & KUSHMAN DECORATIVE CO., Fresco Artists, Fine Modern Wall Papers. 339 Euclid ave.

Foundries.

BOWLER & CO., Car Wheels, Patent Chilled Frogs, and all kinds of castings. 9 Winter.

CLEVELAND MALLEABLE IRON CO., manufacturers Malleable Iron Castins.

LAKE SHORE FOUNDRY, Water and Gas Pipe, Light and Heavy Castings. Alabama st.

TAYLOR & BOGGIS, successors to H. & H. F. Taylor, Iron Founders, 65 to 73 Central Way.

VIADUCT FOUNDRY COM'Y, Aenis, Carlin & Strangward manfrs of Machinery Ca-tings Fine Light Castings a Specialty. Office & Works 11 13 15 and 17 Detroit Strert, near Center.

FITZSIMONS WM. & SON, Rolling Mill and Machinery castings. Rolls a Specialty. No. 435 Broadway.

File and Saw Works.

PARKIN, W. H. & CO., Hand-cut Files and Rasps, dealers in Disston's saws, 11 So. Water

Flue Cleaner.

CLEVELAND FLUE CLEANER M'F'G. CO. manufacturer of Aitchison & Doolittle's Patent Steam Flue Cleaner, 22 & 24 Power Block.

Hotels.

FOREST CITY HOUSE, cor. Public Square and Superior st., Terrill & Ingersoll, Props.

KENNARD HOUSE, D. McClasky, Prop.

NEW ENGLAND HOTEL. Water st., W. W. Wolcott, Prop. Refitted and refurnished.

STRIEBINGER HOUSE, between Ontario and Seneca sts. $2.00 per day. Hawley & Langton

ITY HOTEL, Seneca street. H. B. West, proprietor. $1.50 per day.

Hides, Pelts and Leather.

ENNISON BROS., dealers in Hides, Pelts, Furs and Tallow. 48 and 50 River street.

Hardwood Lumber.

MARTIN, J. T. dealer in Hardwood Lumber, Stone's Levee, near Central Way.

Lumber.

WOODS, PERRY & CO., manufacturers and dealers in Lumber, Lath, etc., 5 Carter st.

FISHER, WILSON & CO., wholesale lumber dealers (pine & hard wood), rough and dressed umber, timber, lath shingles, etc. 47 Central Way

KRAUSE, C. A., & SON, wholesale and retail dealers in lumber. Yards cor. Superior and Wason and 231 Merwin streets.

Cleveland Business Directory.

Hardware and Iron.

BINGHAM, WM. & CO., Hardware, Iron, Nails and Metals, 148 and 150 Water street.

CLEVELAND ROLLING MILL CO., manuf'rs. of Steel and Iron Wire and Steel Tire.

WORTHINGTON, GEO. & CO., Hardware and Dealers in Metals. Water street.

Lime Manufacturers.

RUSSELL LIME CO., manufacturers of White Lime; also dealers in Plaster, Cement, etc. 85 Elm street.

Machinery and Boilers.

CLEVELAND STEAM FURNACE CO., Engines and Boilers, cor. Detroit and Center sts.

KRITCH, K. E. Metal Pattern Maker. Small machinery repaired. Lawn Mower sharpening a specialty. 42 South Water Street.

Machinery Depot.

CLEVELAND MACHINERY DEPOT, (now National Machinery Depot.) The largest stock of New and Second-hand Engines, Boilers and Machinists' Tools. Shop and Warehouse corner Bond and Superior streets.

Mercantile Agency.

THE MERCANTILE AGENCY. R. G. Dun & Co. proprietors. 121 Superior street.

Oil Manufacturers.

AMERICAN LUBRICATING OIL CO., manufacturers of lubricating oils. 23 Euclid ave.

Paints and Oils.

MASTERS, J. N. jobber in Paints, Oils, Varnishes, Brushes, 34 Prospect st.

Pattern and Model Makers.

WHITTINGHAM, J. & C., Metal Pattern and Model makers 52 Canal Street.

REID, J. C., Pattern and Model Maker. 52 Canal Street., (Up Stairs.)

STAIR BUILDER.

PFEIL, CHAS, Stair Builder; Hard Wood Mantles and Office Railing. Works, 49 & 51 Canal street, Cleveland, Ohio

JOHNSON & PURSER, Stair Builders and manuf'rs of Mantels, Odd Pieces of Furniture, &c. 30 West street, up stairs.

Steel Stamps and Stencils.

FLEHARTY, J. H. & CO., Rubber Stamps, Seals, Stencils. 197 Superior street.

Tanners.

GAENSSLEN BROS., Tanners, and dealers in leather, oil and shoe findings. 80 Water-st.

Trunks and Valices.

FABER, J. manuf. Trunk, Traveling Bags and Ladies' Fine Satchels. Sample Trunks and Cases a Specialty. 55 Public Square.

Vessel Agents.

WEBB, H. J. & CO., Ship Brokers and Vessel agents. 17 & 18 Board of Trade Building. 122 Water Street.

Wood Carving.

HERKOMMER, J., Carver and Ornamenter in Composition. 225 Erie street.

Business Directory.

Akron, O.

AKRON IRON CO., manufacture best Common, Refined and Charcoal Iron.

CASCADE HOUSE, cor. Millard Summit sts., near Depot. J. Downie, Prop.

MCNEIL, J. C., Steam Boilers, Heavy Sheet Iron Work. Repairing promptly executed.

PERKINS, C. E., dealer in Agricultural Implements, machinery, and Manufacturers' Ag'nt

TAPLIN, RICE & CO., manuf'rs. of Stoves and Hollow Ware, dealers in Tinners' Stock, etc.

WEBSTER, CAMP & LANE MACHINE CO., Founders and Machinists, 12 Main street.

Alliance, O.

ARLINGTON HOUSE, cor. Main and Liberty Streets. Centrally located. Sample Room for Commercial Travellers. H. S. Adams, proprietor

MCFARLAND, J. W. Engine and Machine Builder, and General Machine Jobbing

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THOMAS BROTHERS, manfrs of Ohio Stone Ware. Cuyahoga Falls Stone Ware Factory, cor. Main and Broad streets,

TURNER, VAUGHN & TAYLOR, manufacture engines, presses and grinding machinery for clay; also paper, chain, wire and flour mill machinery. Send for Circulars and price list.

SNYDER, H. wholesale manufacturer of Sash, Doors, Blinds, &c. Send for Price Lists.

THE CUYAHOGA FORGE AND IRON CO., manfrs. of every description Car, Truck and Driving Axles, Forging, Shafting &c.

Canal Dover, O.

HERKMAN, E., manufr. and dealer in harness leather, upper, kipp and calf. Also, manufacturer & dealer in prime English Dairy cheese. Highest market cash price paid for hides.

Business Directory.

Columbus, O.

PAT. ADJUSTABLE WINDOW CURTAIN Cornice, manufactured by Strader's Curtain Cornice Works.

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Canton, O.

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Geneva, O.

THE ENTERPRISE MACHINE CO., L. L. Crane, Pres't, manfrs of Machinists' Tools and Machinery. Gear Cutting a specialty.

Lima, O.

LIMA HOUSE, centrally located; telegraph office in the house. J. Goldsmith, Prop.

Massillon, O.

CITY CARRIAGE WORKS, P. H. Young, prop. manfact'r of Carriages, Phætons and Spring Wagons. Work warranted. Cor. Tremont & Erie.

Painesville, O.

NORTH AMERICAN CUTLERY CO., m'fr's of Steel Shears and Scissors—best quality.

Ravenna, O.

THOMPSON, T. F., dealer in Agricultural Implements, farm machinery, hardware, seeds, fertilizers, &c. Cor. Main and Prospect sts.

BALDWIN, D. L. & SON, Contractors & Builders and manfrs of all kinds of Moulding, flooring, siding, &c. Rip, Band and Scroll Sawing.

Steubenville, O.

DORRANCE, D. W., Tool Works, manufacturer of hand-made miners' and stone-cutters' Tools Promp attention given to mail orders.

Sandusky, O.

SANDUSKY WHEEL CO. manfrs. of Sarven Patent Wheels, Carriage Bodies and Seats, Plain Wood Hub Wheels, Banded Hub Wheels, Jacobs' Patent Neck Yokes.

Toledo, O.

BAKER, HERBERT, Machine Shop and Iron Foundry. 98 and 100 Erie street.

TOLEDO FOUNDRY AND MACHINE CO. builders of Steam Engines, Circular Saw Mills and all kinds machinery. Water St., cor. Cherry

RUSSELL IRON WORKS, mnfrs. of Architectural Iron Work, castings, pulleys, shafting and steam bending machinery. Cor. Water and Lagrange streets.

STANDARD SAW WORKS, H. Bartley, manufacturer and dealer in Saws of every description All kinds of Springs made from Sheet Steel. Reaper, Hay Knives Truss Springs, &c. made to order. 92 St. Clair Street.

UNION Wooden Ware Manufacturing Co. manufacture Sewing machines, washboards, children's wagons, carts, wheelbarrows, sleds, kitchen wooden ware, &c.

HEPBURN BROTHERS, proprie. Union Boat Works. Boats of all kinds made to order. For sale or rent. Water Street foot of Cherry.

Youngstown, O.

BELL, EDWIN & SON, manuf. of Nail Kegs, Pat. coiled hoops, slack barrel and keg heading and oil barrel stock.

DINGLEDY, G. H. dealer in rough and dressed Lumber, Shingles and Lath.

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TOD HOUSE, cor. Diamond and Market streets. Hankel & Bowman, Props.

Zanesville, O.

KIRK HOUSE, William Kirk, proprietor. $1.50 per day.

Rochester, Pa.

OLIVE STOVE WORKS, (limited) manufacturers of Stoves and Hollow Ware.

Erie, Pa.

ERIE STEAM BENDING WORKS. H. G. Fink, prop'r, manufacturer of Bent Felloes, poles, snafts, bob runners, etc. Cor. 12th & Cherry.

GUNNISON, A. B., wholesale manufacturer of Wood Pumps. 233 East Twenty-Second St.

BALL ENGINE CO., limited, manufacturers of Automatic Engines of 15 to 80 horse power

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Business Directory.

Titusville, Pa.

FOSTER & McKAY, dealers in boilers and engines, tubing, casing, old iron, rope, and all kinds of metals. Washington street, nr. Railroad.

Meadville, Pa.

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Pittsburgh, Pa.

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Wheeling, W. Va.

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Louisville, Ky,

HAIGHT, ROBERT, Gold, Silver and Nickel Plating and Brass Finishing Shop. Car Trimmings and Steamboat work a specialty. 1 West Market street

Union City, Ind.

LAMBERT, J. W. & CO., mfrs of fork, rake, hoe and broom handles; spokes, hubs, whiffletrees, yokes, plow-rounds, &c. Correspondence solicited.

Olean, N. Y.

MYRICK BROS. & CO., manufact'rs Engines and Boilers, oil drilling tools, rig irons, etc.

Rochester, N. Y.

GOWE, JNO. N., mfrs. of Specialties, such as Machine forging, bridge bolts and trusses, railroad switches, spike, mall, chisels, &c.

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ULSCHT & LINN mfrs of Wood Lathes, Engraving Machinery, &c 131 N. Water street

RAZOR STROPS. Sole mfrs. of all kinds of Razor Strops. Ulscht, Linn & Co. 131 N. Water

Buffalo, N. Y.

SANDS, PAUL, Marine and Stationary Steam Engine Works mfr. of drilling machines, foot and power lathes. 70 Columbia street.

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WHITE, L. & I. J. manfrs of Coopers' Tools, Carpenters Tools, Draw Shaves, Cleavers Choppers, Ship Tools, &c. 312 Exchange street.

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Cut More	₱ doz	9 00
Peck's Double Bit	₱ doz	22 00
" Champion Blade	₱ doz	11 00

Anvils.

Eagle, Amer.	per lb. 10c dis 20
Wright's	10¾c@11c
Armitage's Mouse Hole	9¾@9¾c
Trenton	10¾c
Wilkinson's	10¾c

Anvil Vise and Drill.

Millers Falls Co. $28	dis 20
Cheney Anvil and Vise	dis 25&2

Vises.

Solid Box, list of July 1, '79, dis 35

Solid "Crown" (A. H. Hildick)	40 to 100 lb. 15c net
Solid, Peter Wright's	15½
Solid, Wilkinson's	13½
Parallel, Parker's	dis .0
Saw Filers, Hopkins'	₱ doz $17.50, dis 10
Reading	dis 45&10
Cowell Hand Vises	dis 20
Richardson's Vise and Anvil	dis 25

Augurs and Bits

	Dis
C S cut augurs	40&10
do do do bits	40&10
D C gimlet do Ives	dis 50
Snells bits	dis 40
Russell Jennings' augers	dis 16⅔ &10&10
Cook's pat augur	40&10

Animal Pokes.

Berea, per doz	4 00
Eagle, per doz	5 00

Apple Parers.

Domestic & Reading	₱ doz $7 50
Turn Table	5 00

Bolts.

Machine	dis 60
Bolt ends	dis 60
Plow	dis 50
Plow, R. B. & W	dis 40
Cast Iron Barrel Shutter, etc	dis 50&10
Cast Iron Chain (Sargent' list)	dis 60&10
Ives' Pat. Door Bolts	dis 50
Wrought Barrel	dis 55&10
Wrought Square	dis 55&10
W'g't Shutter, all iron, Stanley's list	dis 50&10
Union Carriage	dis 70
Tire, R. B. & W., new list	dis 70&10
Stove, American Screw Co.'s	dis 40

Bellows.

	Dis
Blacksmith's com new list, 45 ₱ ct	
Moulder's new list, dis 25 ₱ cent	
Hand, new list, 25 per cent	

Butts.

	Dis
Wrought brass	65&10
Cast, loose joint	10&10
Pin, japanned and silver tipped	
Wrought, fast joint narrow	45&10
Wrought fast joint broad	40&10
Wrought loose joint broad	40&10
Wrought table and back flaps	45&10
Loose joint, reversible	40&10
	45&10

leveland Stamped Elbows

Genuine Russia Iron

4 inch	per doz	4 50
4¼ do	do	5 00
5 do	do	5 50
5½ do	do	7 50
6 do	do	8 50
7 do	do	9 50
		11 00

Planished American Russia Iron

4 inch,	per doz	4 00
4¼ do	do	5 00
5 do	do	6 50
5½ do	do	7 50
6 do	do	8 50
do	do	9 50

Charcoal Iron

4 inch,	per doz	2 00
⅝ do	do	2 50
⅔ do	do	3 50
6 do	do	4 00
7 do	do	4 50
		5 50

25 per cent

Chisels.

Hot and cold cutting	₱ lb 30
Railroad track	30
Machinists	30
Mallet head	30
Tape	50
Packing	50
Stone cutters	50
	50

Crowbars.

Cast steel	₱ lb 8½
Iron, steel points	6½c

Cutlery, Pocket and Table.

Meriden Cutlery Co., table	net
Am. Miller Bros.' Cutlery Co	dis 25
Humason & Beckley,	
Naugatuck Cutlery Co pocket	33½
Aaron Berkenshaw's pocket	dis 25

Crucibles.

Per number	4@ 4¼

Chains.

Coil by cask.

3-16	¼	5-16	⅜	7-16	½
10½	9	8	7	6½	6¼

Drills and Drill Stocks.

Blacksmiths', each	$2.50 dis 10
Blacksmiths', self-feeding, each	7.50 dis 20
Breast, P. S. & W	dis 20&10

Drawing Knives.

Witherby's	dis 65@10
Nobles Mfgr. Co	15
Adjustable handle	20

Emery and Emery Paper.

Regular Numbers	₱ lb 6c
Flour and F. F	₱ lb 4c
B. & A. Emery Paper	dis 30&5

Enameled and Tinned Ware.

Kettles	
Sauce Pans	dis 50
Tinned Sauce Pans	dis 25
	dis 50

Files.

Auburn	.5 to £ dis 35 pr cent
E. M. Boynton's, new list	dis 25
J. & Riley Carr	4.50 to £
Johnson & Bro	dis 30
Butcher's	4.50 to £
Walter Spencer & Co.'s "Diamond"	4.50 to £
Fisher's	4.75 to £
Moss & Gamble	4.50 to £
H. Disston & Sons (new list)	dis 40 per cent
Heller Bros.' Horse Rasps	
Nicholson	dis 25
New American	dis 40
Union File Co	dis 40

Grindstones.

Ohio	1½@1¾ ₱ lb
Nova Scotia	1¾@1¾ ₱ lb

Hammers.

Maydole's	dis 15
Cheney's	dis 25
Hartford Hammer Co	dis 20
Humason & Beckley	dis 50
Verree	dis 5
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50 and $1.75,	dis 25&10
Nelson Tool Works	dis 40&10
Warner & Noble's	dis 5
Kip's	dis 15
Yerkes & Plumb	dis 15
Wilkinson's Smiths'	11¾c ₱ lb net

Hatchets.

Yerkes & Plumb:--Shingling, Nos 1, 2, 3,	₱ doz $7 50, $8 00, $8 50, dis 25
Claw, No. 1, 2, 3,	₱ doz $8 25, $8 75, $9 25, dis 25
Lathing, Nos 1, 2, 3,	₱ doz $7 50, $8 00, $8 50, dis 25

Nails.

20 to 60d	3 40
8 and 9d	25
6 and 7d	50
4 and 5d	75
3d	1 50
2d	2 75
3d fine	3 00
2d fine	3 75
¼ inch	3 00
4d barrel	1 00
1¼ inch barrel nails	1 50
1¼ do do do	1 75
1 do do do	2 50
⅞ do do do	3 00
Cut spikes, all sizes	1 75
Clinch nails, all sizes	
Casing and box nails 75 cts advance	
Finishing nails, $1 25 do	
Tobacco nails, 50 cts do	

Nuts and Washers

Nuts, square	.7c off list.
Nuts, hexagon	1c. off list.
Washers	6c off list.

Picks.

Railroad,	4 to 5 lbs	doz $7 75
	5 to 6 lbs	7 75
	to 7 lbs	8 50
	7 to 8 lbs	9 50
Railroad Tamping Pick	7 to 8 lbs	doz 13 50
Mill Picks per lb		75c

Rivets.

Iron	dis 40
Tinned	dis 40
Copper	dis 33⅓

Squares.

	Dis
Steel or iron, case lots	50
Try squares and T bevels	40

Spikes—WROUGHT

All lengths by ¼ inch	4½c
do do do 5-16	3½
do do do ⅜, 7-16 & ½in	3¼

Shovels and Spades.

Ames' new list, July 1, 1881,	
Old Colony	dis 15
Remington's (Lowman's Patent)	dis 15
Rowland's	dis 30
Griffiths	dis 40 and 10
	dis 40&10

Saw Sets.

Boynton s patent X Cut, per doz $12; Hand Saw, per doz $10.	dis 20
Stillman's Genuine, per doz $3 50 and $5 50	dis 20
Stillman's Imitation, per doz $3 25	dis 20&10
Common Lever, per doz $2	dis 30&10
Leach's No. 0 $8; No. 1 $15;	dis 15
Hammer, Hotchkiss $5 50,	dis 10
" Bemis & Call Co.'s new patent	dis 40&5
Bemis & Call Co.'s Lever and Spring Hammer	dis 30&5
Bemis & Call Co.'s Plate	dis 10
" " Cross-cut	dis 12½
Aiken's Genuine	$13, dis 50&10
" Imitation	$7, dis 50
Hart's Patent Lever	dis 20
Disston's Circular	dis 40

Sad Irons.

From 4 to 10 lbs	per lb 33⅓ net
Self-Heating	₱ doz $9 net
" Tailors	₱ doz $18 net
Gleason's Shield and Toilet	dis 25
Mrs. Pott's Irons, double pointed	dis 35
Mrs. Pott's Irons, square back	dis 35
Enterprise Star Irons	dis 40
Combined Fluter and Sad Iron	₱ doz $15, dis 15

Scales.

Hatch, Counter, No. 171	₱ doz. $42, dis 37½&10
Union Platform	$6, dis 45
Fairbanks'	dis 20
Buffalo Scale Co	dis 20&5
Forsyth Scale Co	dis 20&10
Howe's	dis 25
Chatillon's Eureka	dis 25
Family Universal	dis 50
Scale Beams	dis 33⅓&10

Bag Holders.

Sprengle's Pat, $18.00 per doz 40 per cent. dis.	

Planes.

Ohio Tool Co	dis 25
Sc ota	dis 30
Bailey's Pat. Adj-table.	dis 20@25

Rules.

Stanley	dis 66⅔ and 10

Sash Locks. Discount.

Payson Mnfg. Co. "Perfect"	42
Simmons' Sash Supporters	20

Hinges.

Champion double acting spring hinges	dis. 30
Screw & Strap 8@12 in.	$6. net
Gravity Locking Blind Hinges, Sargeant & Co.	70&10

Screws. Dis

Flat head iron or steel per cent dis.	
Flat head brass	30
Round head iron or steel	30
Round head brass	25
Brass and Silver capped	20
Japanned, list of Plain Screws	40
Coach, patent Gimlet point, list per 100	20
Lag, taper points	60
Bed	60
Machine, flat head, iron	10
round head, iron	55
Bench, iron	50
wood, beech, per doz $3	55&10
wood, hickory	10
	20&10

Valves. Dis.

Jenkins' Patent Gate Valves	35
" " Globe "	40
" Standard Packing "	20

Wrenches.

Coe's genuine	40 & 10
Coe's imitation wrought bar	60
Mechanics'	60 and 10

Wire.

Brass and Copper	dis 20
Bright & annealed, Nos. 0 @ 18	dis 50@52½
" " Nos. 19 @ 26	dis 60
" " Nos. 27 @ 36	dis 65
Coppered Nos. 0 @ 18,	dis 45
Galvanized, Nos. 0 @ 18, market list,	dis 40@45
Tinned, Nos. 0 @ 18,	dis 40@45
Cast steel	dis 40
Tinned Broom Wire, Nos. 18 @ 25	dis 55
Annealed Fence, Nos. 8 and 9	dis 55@52½
Annealed Grape, Nos. 10 to 14	dis 52½
Galvanized Telegraph, Nos. 7 to 9	₱ lb 7¼c
Galvanized Telegraph, Nos. 10 to 11	₱ lb 8¼c
Galvanized Telegraph, No 12	₱ lb 10½c
Fence staples	₱ lb 5½@5¾c
Fence Staples, galvanized,	₱ lb 7@7½c
Stubs Steel Wire	$7 00 to £
Barb Wire, painted	8¼c
Barb Wire, galvanized	9¼c
Crucible Steel Ropes from ¾ in. at 9c to 1⅛ in. at	52c
Best Selected Iron Ropes from 3-16 in. at 3c. to 1¼ in. at	33c

Boiler Plates.

("Gaylord"--Standard Quality.)

C. No. 1	4 50
C. H. No. 1 Shell	4 75
C. H. No. 1, 50,000	5 25
C. H. No. 1, 55,000	5 75
C. H. No. 1 Flange	6 50
Firebox	
T. S., 60,000	(as per) .6 50
T. S., 65,000	(act of)
Homo. Steel, 70,000 (of Cong)	.7 50
Heads, ½c ₱ lb extra.	

N.B.—Eastern brands of boiler plate at from 2-10 to 3-10c ₱ lb less than above prices.

Sheet and Tank Rivets. "Norway."

All sizes	dis. 15

Boiler Rivets—"Albany."

½, ⅝, 11-16, and ¾ in. diam	5 50

Boiler Makers' Tools.

Doty's Power Shears	net list
" Hand Lever Shears	net list
" Power Punch	net list
" Hand Punch	net list
Steel Screw Punch	net list
Iron Screw Punch	net list
Boiler Plate Rolls	net list
Buffalo Forge & Blowers	dis 20
Watson's " "	net list
Spring Tube Expander	dis 15
Roller Tube Expander	net list
National Tube Cleaner	dis 20
Wire Flue Brushes	net list
Anvils—"Peter Wright"	12½ ₱ lb
Solid Box Vises	net list

Nuts, Bolts, etc.

Square & Hex. Nuts	6¾ off list
Washers	6¼ off list
Machine Bolts	dis 60
Bolt Ends	dis 60
Boiler Patch Bolts	net list

Boiler Tubes.

"National" Standard Gauge 1 inch to 10 inch	dis 37½
"National" Standard Gauge 11 inch to 15 inch	dis 25
"National" Special Locomotive Tubes	net list

IRON AND STEEL.

Flat Bar.

1¼ to 4 by ⅜ to 1 inch	2 85
4½ to 6 by ⅜ to 1 inch	3 00
1¾ to 6 by 1⅛ to 1½ inch	3 25
1¾ &1¾ by ⅜ to ½	3 00
1 & 1¼ by ⅜ to ½	3 10
⅝ ¾ and ⅞ by ⅜ to ½	3 25

Round.

1 to 1⅜ inch	2 85
2 to 2⅜	3 15
2⅝ to 3¼	3 45
3⅜ to 4	3 50
4⅜ to 4½	3 45
4¾ to 5	4 90

Square.

1 to 1⅜ inch	2 85
2 to 2⅜	3 10
2⅝ to 3¼	3 45
3⅜ to 4	4 00
⅞ to ⅞	3 00

Heavy Band.

1⅛ to 6 by ¼ and 5-16 inch	3 10
1 to 1¾ by ¼ and 5-16 do	3 15
⅜ to ⅞ by ¼ and 5-16 do	3 50
⅜ to ½ by ¼ and 5-16 do	3 10

Half Oval and Half Round.

Wagon box iron ¾ and ⅞	4 80

1-10c per lb extra will be charged for cutting to specified lengths.

Light Band.

1¾ to 6 by ⅛ to 3-16	3 50

Hoops.

1¼ to 2 , Nos 16 to 18	3 90
1¼ to 4 do 13 to 15	3 60

1-10 extra for each gauge lighter

Sheet Iron.

No 22 to 24	5 60
No 25 to 26	5 85
No 27	6 10
No 28	6 60

English Steel.

Best cast	₱ lb 15½c
Extra cast	16½c.
Round machinery, cast	14c
Swaged, cast	18c
Best double shear	15½c
Blister, 1st quality	13c
Refined tool steel	16½c
Spring calking	7¼@7⅝c
German steel, best	11c
2d quality	10c
3d quality	9c
Sheet cast steel, 1st quality	15½c
2d quality	14½c
3d quality	12¾c

American Steel.

Best brands of refined cast steel, ¾ to 2 inches	12c
Crucible cast	7c
Open-hearth ditto	4½c
Hammer cast steel	9c
Spring cast steel	7½c
Bessemer and open-hearth spring	5c
Ditto plow	5c
Steel boiler plate	4½c
Bessemer machinery	6½@7c
Spring and calking	5 @6c
Tire	7½@7½c
Sleigh shoe	5
	5

Bessemer Steel Tire.

¾ to 1 by 3-32	4½ ₱ lb
¾ to 1 by ⅛ to 5-32	4½ ₱ lb
¾ to 1 by 3-16 to ¼	4½ ₱ lb

Miscellaneous Cast Steel.

Auger and auger bit	1
Axle steel for wagons	7
Frog points and plates	8
Frog size bars	8½
Pick, hammered	10
Mattock, beveled	9
Table cutlery	7½
Trap spring steel	10
Pike and cant hook	9
Coal and granite	8½

TINNER'S STOCK.

Tin.

Banca	per lb 28@29c
Straits	" 24@25c
English	" 24@25c
Bar	" 27c

Tin Plate.

IC 12x12 charcoal	$ 6 50
IC 14x20 do	6 25@6 50
IX 14x20 do	8 25
DC 12½ x 7 do	6 00
DX 12½x17 do	8 00
DXX 12½x17 do	10 00
DXXX, 12½x17 do	12 00
IC, 20x28 do	14 50
IX, 20x28 do	15 50
IC, 14x20, Best Roof	6 00
IX, 14x20, do	8 00
IC, 20x28 do	13 00
IX, 20x28 do	14 50
IC, 10x14 Best Coke	5 75

Solder.

Half and Half, in bars	15½
No. 1 do	14½
Spelter Solder	25

Pat Planished Sheet Iron.

A	per lb 10½c
B	9½c

Nos	10	15	21	25
	to 14	20	24 & 26	
Com	3-60	3-80	4-00	4-20
Char	5-60	5-60	6-00	6-20

Sheets over 28 in. wide ½c extra

Zinc.

Sheet, cask	7½@ 7¾
Sheet, open	8@ 8¼

Tinners' Tools & Machine

Machines (P. S. & W.)	list add 20
Tools (P. S. & W.)	add 5

Plumbers', Steam and Gas Fitters' Supplies.

Wrought Iron Pipe	dis 50.
Enameled Pipe	dis 65
Artesian Well Casing	net list
Hydraulic Tubes	net list
Malleable Iron Fittings	net list
Cast Iron Fittings	dis. 35
Globe Valves	dis. 35
Angle Valves	dis. 35
Check Valves	dis. 35
Safety Valves	dis. 45
Eddy Gate Valves	dis 35
Steam Cocks	dis. 20
Service Cocks	dis. 35
Ball Gauge Cocks (net per dozen)	dis. 35
Compression Gauge Cocks	$15
Miss. Gauge Cocks	dis. 35
Register Gauge Cocks (net per dozen)	dis 35
Cylinder Cocks	$15
Air Cocks (net per dozen)	dis. 30
Oil Cups	$2 75
Steam Gauges	dis 30
Water Gauges	dis. 40
Scotch Glass Tubes	dis. 40
Steam Whistles	dis. 50
Iron Body Globe Valves	dis. 35
Iron Body Safety Valves	dis. 35
Iron Bod Steam Cocks	dis 35
Pipe Tools	dis 35
Globe, Angle and Check Valves (Star's regrinding)	special
Mack's Injectors	dis. 25
	dis. 25

Babbitt Metal.

No. 1	₱ lb 16
" 2	" 14
" 3	" 10
" 4	" 8

LEAD.

American,	₱ lb 5½c
Bar,	₱ lb 5¾c dis 10 per ct
Pipe,	₱ lb 5¾c dis 10 per ct
Sheet	₱ lb. 8c dis 10 per ct
Tin-lined pipe	₱ lb 15c dis 10 pr ct
Shot Drop 7c; Buck	7c
Chilled Shot	8c

COPPER.

Lake Ingot	18½@18¾c
Baltimore	17½@17¾c
Arizona	17¾c
Sheathing Braziers Copper, Bolts, &c.	
Brazier's Copper, ordinary sizes, 16 oz. per sq. foot, and over per lb	30c
Brazier's Copper, ordinary sizes, under 16 oz. and over 12 oz. per sq. foot, per lb.	32c
Brazier's Copper, 10 oz and 12 oz. per sq ft. per lb.	34c
Brazier's Copper lighter than 10 oz. per sq. ft. per lb	36c
Circles less than 84 inches in diameter per lb.	33c
Circles 84 inches in diameter and over per lb	31c
Segment and Pattern sheets per lb.	33c
Locomotive Fire Box sheets per lb.	30c
Sheathing Copper, over 12 oz. per sq ft per lb.	28c
Bolt Copper per lb	30c
Copper Bottoms per lb	31@32c

No copper is Sheathing except 14x10 inches, and not to exceed 34 oz. to the sq ft

Tinning.

14x18 per sheet	6c

All other size sheets, 2½c per square foot. For tinning both sides, double the above amount.

SCRAP IRON AND OLD METAL

DEALER'S SELLING PRICES.

	Net Tons.
No. 1 wrought scrap	$24
Sheet and hoop "	10@11
Cast scrap, (No. 1 heavy)	19
Cast Scrap (Stove Plate)	12

OLD METALS.

Old copper per lb	15c
No. 1 H. Brass per lb	14
Heavy yellow Brass do	12
Light Brass per lb	12
Scrap Zinc per lb	6
Tea Lead per lb	4
Heavy Lead per lb	3

PIPE, WROUGHT.

Standard Wrought Iron Lap Welded Steam and Gas

Inside Diameter. Inches.	Plain, Price Per Foot.	Galvan or Enameled Per Foot.	Outside Diameter Inches.	Weight Per Foot.
⅛	08		.40	.24
¼	08	$0 11	.54	.42
⅜	09	12	.67	.56
½	11	15	.84	.85
¾	13½	19	1.05	1.13
1	19	28	1.31	1.67
1¼	27	40	1.66	2.26
1½	33	47	1.90	2.69
2	46	64	2.37	3.66
2½	75	1 00	2.87	5.77
3	95	1 30	3.50	7 55
3½	1 25	1 70	4 00	9.05
4	1 50	2 05	4.50	10.78
4½	1 75	2 40	5.00	12.49
5	2 25	3 00	5.56	14.56
6	2 75	4 00	6.62	18.76
7	3 75	....	7.62	23.00
8	4 75	....	8.62	28.00
9	6 50	....	9.68	34.40
10	8 00	....	10.75	40.64
12	12 00	....		54.65

Discount, 62½ per cent; galvanized, 62½ per cent.

BRASS.

Cash prices for Roll and Sheet Brass. For less quantity than 100 lbs. add 3c per lb.

High Brass

All Nos not thinner than 20 No 28, wider than 2 in. not wider than 14 inch	30c
All Nos to No. 28, inclusive, and widths over 14 to 20 in. inclusive	35c
All Nos. to No 28, inclusive, and widths over 20 to 30 in. inclusive	38c

¼c per lb. advance on each No above Nos. 28 to 38, inclusive.

All Brass thinner than No. 8 is Platers' Brass at	53c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 inches, in width wider than 2 inches	37c

Low Brass.

4c per lb. more than High Brass.

Gilding metal 8c per lb. more than High Brass	
Platers' or Gold Metal In Bars	48c
Sawed	51c
Planed or Polished	54c

For Slitting

Metal in width in. to ⅛ in. to No 28, inclusive, 1c per lb advance.

Metal, in width 2 in. to 1 in, thinner than No. 28, 2c per lb. advance.

Metal, in width ⅛ in. to ¼ in. thinner than No. 28, 5c per lb. advance.

Metal ¼ in in width and less, 10c per lb. advance.

Any of the above widths cut to particular lengths, add 7c per pound.

COAL,

WHOLESALE.

Wholesale f.o.b vessel at Cleveland:

Carbon Hill and Monday Creek	
Massillon	$2 65
Brier Hill	2 75@ 2 85
Pittsburgh	3 25@3 75
Salineville	3 00
Tuscarawas	2 25
	2 25

RETAIL.—Delivered.

Massillon Lump	$4 60
" Nut	3 75
Carbon Hill and Monday Creek, lump	3 75
Carbon Hill and Monday Creek, nut	3 50

75c less on cars by car load.

Anthracite Stove and Chestnut	7 15
Egg and grate	6 00

GLASS.

(Per box of 50 feet)

SINGLE THICKNESS

6x8 to 10x15	
11x14 to 15x24	
16x24 to 20x28	8 50
15x34 to 24x30	9 75
26x28 to 24x36	10 75
26x36 to 26x44	11 50
26x46 to 30x50	13
	14 00

DOUBLE THICKNESS

6x8 to 10x15	11 7
11x14 to 15x24	13 25
16x24 to 20x28	15 75
15x34 to 24x30	17 25
26x28 to 24x36	18 50
26x36 to 26x44	21 25
30x50	22 50
30x52 to 30x54	23 25
30x56 to 34x56	25 00
34x58 to 34x60	27 75
36x60 to 40x60	30 00
Dis 60 & 15 single, 60 & 20 double	

OILS.

Pure Oils, packages included	
Sperm, winter bleached per gal	1 25
Whale, winter bleached per gal	63
Straits	50 @ 53
"A" oil for tanner's use	35 @ 40
Lard oil extra W S	92
do No 1 do	83
do No 2 do	68
Tallow oil	75
Neatsfoot oil pure	1.05
do No 1	80
Linseed oil, raw	55
do do boiled	58
Cotton seed oil white	64 @ 66
do do yellow	60 @ 63
West Virginia lubricating 28 deg	11c@15c
Pure Mecca	55@ 50
Paraffine oil winter pressed	25@ 30
Machinery	40
Engine	50
Miners' oil	40@45
Drilling oil	40

Hides and Leather.

Prime cured hides,	7¾
Green hides	6@6¼
Bull, scrubby, badly scored or damaged, cured, two-thirds price.	
Prime dry hides	@14
Horse hides, green	$1 75@2 00
Horse hides, dry	$2 00@2 25
Prime cured veal calf	12½
Prime Deacon Skins, salted	65@70
Pelts, wool on	32@34
Fresh slaughter sheep	50@$1 50
Fresh slaughter lambs	50@60
Green calf skins	13
Hemlock rough	23@20
Oak harness	34@33
Oak sole	37@40
Union harness	$1@40

LUMBER.

PLANK, MIXED WIDTHS.

2 inch, 12, 14 and 16 feet, together.

A 1 and 2 uppers	$50
A 3	40
B	32
C	22
D	15
E	13

1¼ and 1½ inch.

A 1 and 2 uppers	$48
A 3	40
B select	32
C	21
D	15
E	13

BOARDS.
One Inch, mixed widths.

A 1 and 2 uppers	$44
A 3	36
B select	30
C	19
D	16
E	13

STOCK BOARDS.
12 Inches wide.

A 1 and 2 uppers	$45
A 3	38
B	32
C	21
D	16

STRIPS.
6 Inches wide.

A 1, 2, and 3	$42
B	32
C	22
D	16
E	13
Norway Fencing Strips	17
Norway Flooring Strips	25

WORKED LUMBER
FLOORING.

Flooring—A 3	$42
B	38
C	24
D	20
Norway Flooring—A 3	28
C	22
D	18
Matched Drop Siding, 6 inches—A 3	42
B	38
C	24
D	20

Beaded Ceiling $2 higher than Flooring.

One half inch Bevel Siding—A 1 and 2	24
A 3	20
B	18
Ash Flooring—A 1 and 2	40

BILL STUFF.

Small, joists, 12, 14 and 16 feet	$15
Timber, larger than 8x8 special.	
Timber, longer than 18 feet, adds about $1 per foot per M. extra.	
Cedar Posts, large	30 00
" " medium	25 00
" " small	$15 to 20 00

SHINGLES, LATH AND MILL WORK

Shingles XXX	$4 50
Clear Butts	3 25
Lath	3 00

Surfacing, one side, adds $1.25; two sides $1 50
Matching, flooring and drop sidings, $2.50.

LAKE FREIGHTS.

COAL.

Buffalo to Chicago	$.62½@.65
Toledo to Chicago	1.00
Cleveland to Chicago	70@75
Erie to Chicago	70@75
Oswego to Chicago	1.50
Fairhaven to Chicago	1.30
Buffalo to Millwaukee	70@75
Cleveland to "	70@75
Erie to Milwaukee	75
Buffalo to Racine	80
Buffalo to Kenosha	85

IRON ORE.

Marquette to Lake Erie ports	1.25
Escanaba to Lake Erie ports	90@95
Escanaba to Chicago	90@95
Marquette to Chicago	1.15@1.20

COLORADO EXCURSION RATES.

The Pennsylvania Company and Pittsburgh, Cincinnati & St. Louis Railway Company will, on July 15th, make a sweeping reduction in Excursion Rates from all Stations on their lines to Denver and return. Sale of tickets will continue till September 25th, 1882. The National Mining Exposition, which will represent all the resources, industries and attractions of the Rocky Mountain region, will open at Denver, August 1st. Drop a postal to E. A. Ford, General Passenger Agent, and ask him to send you pamphlet giving routes and Rates of Fare, they are furnished free of charge.

AN EXTRAORDINARY OFFER.

There are a number of persons out of employment in every county—yet energetic men willing to work do not need to be. Those willing to work can make from $100 to $500 a month clear, working for us in a pleasand permanent business. The amount gents make varies,—some making as $500 a month, while others as low as all depending on the energy of the . We have an article of great merit. ould be sold to every House-owner, and over 100 per cent profit. Each sale is n $3.50 to $10.00. One agent in Pennvania sold 32 in two days, and cleared $64.00. An agent in New York made $45.00 in one day. Any man with energy enough to work a full day, and will do this during the year, can make from $2,000 to $6,000 a year. We only want one man in each county, and to him will give the exclusive sale as long as he continues to work faithfully for us. There is no competition, and nothing like our invention made. Parties having from $200 to $1,000 to invest, can obtain a General Agency for ten counties or a State. Any one can make an investment of from $25 to $1,000 without the least risk of loss, as our Circulars will show that those investing $25 can, after a 30 days' trial, return the goods unsold to us and get their money back, if they do not clear at least $100. They show that a General Agent who will take ten counties and invest $216, can, after a trial of 90 days, return all goods unsold to us, and have money returned to them if they fail to clear at least $750 in that time. We are not paying salaries, but want men willing to work and obtain as their pay the profits of their energy. Men not willing to work on our terms will not work on any. THOSE MEANING BUSINESS will receive our large descriptive circular, and extraordinary offer by enclosing a three-cent stamp, with their address. The first to comply with our terms will secure the county or counties they may wish to work.

Address,
RENNER MANUFACTURING CO.,
118 Smithfield Street,
Pittsburgh, Pa.

Cleveland to New York,

VIA THE

NEW YORK, PENNSYLVANIA AND OHIO RAILROAD.

Formerly Atlantic & Great Western Railroad.]

For New York, Boston and the East. The shortest and quickest route to Pittsburgh, Washington, Baltimore and the Southeast

Until further notice trains will leave the new Central Depot, South Water Street and Via luct, as follows:

7:10A.M. LIGHTNING EXPRESS, (daily,) sleeping and hotel coaches from Leavittsburg. 8:55 a.m. To New York, Albany and Boston without change. Parlor car, Cleveland to Salamanca. Arrives at Meadville 11:20 a.m., (dinner); Franklin, 12:33 p.m.; Oil City, 1:00 p.m.; Corry, 1:00 p.m.; Jamestown, (Lake Chatauqua) 1:57 p.m.; Buffalo, 6:15 p.m.; Rochester, 8:30 p.m.; Hornellsville, 6:40 p.m., (supper); Corning, 8:25 p.m.; Elmira, 8:57 p.m.; Binghampton, 10:58 p.m.; Albany, 6:00 a.m.; Boston, 2:45 p.m.; arriving at New York, 6:50 a.m.

10:45 P.M. NIGHT EXPRESS, (daily except Sunday), Sleeping Coach from Leavittsburg to New York without change. Arrives at Youngstown 1:45 a.m.; Meadville, 3:50 a.m.; Corry, 5:20 a.m.; Jamestown, 6:22 a.m.; Buffalo, 9:45 a.m.; Rochester, 1:10 p.m.; Hornellsville, 11:20 a.m.; Corning, 12:53 p.m.; Elmira, 1:21 p.m.; Binghampton, 2:50 p.m.; New York, 9:25 p.m.

2:30 P.M. PITTSBURGH EXPRESS,—daily, through without change. Parlor Car, Cleveland to Pittsburgh, arrives at Youngstown, 5:00 p.m.; Pittsburgh, 7:48 p.m.; Washington, 7:30 a.m.; Baltimore, 8:15 a.m.; via Sharon and Sharpsville to Meadville 7:40 p.m.; Corry, 9:10 p.m.; Lakewood, 9:50 p.m.; Jamestown, 10:00 p.m.; Salamanca, 11:10 p.m.

4:25 P.M. MAHONING ACCOMMODATION, stopping at all way stations. Arrives at Youngstown, 7:25 p.m; Sharon, 8:30 p.m; Sharpsville 8:40 p.m; connects at Leavittsburg with train No. 20 for Meadville and intermediate points, arrives at Meadville, 11:05 p.m. Pittsburgh, 10:38 p.m.

7:10 A.M. PITTSBURGH EXPRESS,—(daily) through without change. Arrives at Youngstown, 9:50 a.m.; Sharon, 10:55 a.m.; Sharpsville, 11:05 a.m.; Pittsburgh, 12:45 p.m. Returning, leave Pittsburgh, 4:48 a.m., 8:33 a.m., and 1:13 p.m. and 4:20 p.m.

11:00 A.M. YOUNGSTOWN & PITTSBURGH Accommodation, stopping at all Way Stations, arriving at Youngstown 1:50 p.m.; Pittsburgh, 6:10 p.m. Trains arrive at Cleveland, 6:50 a.m., 10:55 a.m. 2:00, p.m. 7:00 p.m., and 10:15 p.m.

☞ This is the only route by which passengers can reach Corry, Elmira, Binghampton, New York City, and intermediate points WITHOUT CHANGE. No change to Boston and New England cities.

Baggage Checked Through to All Points East

☞ Through Tickets and information regarding the route can be obtained at the Union Ticket Office, corner Bank and Superior streets; at office 131 Bank street, and at new Depot of New York, Pennsylvania and Ohio Railway, South Water street and Viaduct, Cleveland.

A. E. CLARK,
Gen. Pass'r. Agt., Cleveland, Ohio.
M. L. FOUTS,
P. D. COOPER, Pass. Agt., 131 Bank st.,
Gen. Man'gr. Cleveland. Cleveland.

NOTICE.—Hereafter all Passes must be returned to the General Passenger Agent within FIVE DAYS after date of expiration; otherwise they will be discontinued.

Geo. Oliver,
Manufacturer of the
IMPROVED
UNITED STATES
BRAN DUSTER,
Mill street corner Brown
Rochester, N.

Bran Dusters, Brushes and Wire Cloth furnished to order at Lowest Prices.

TRAVELERS' REGISTER.

Lake Shore & Michigan Southern.

Trains marked with a * are the only trains that arrive and depart in this city on Sundays.

EAST BOUND TRAINS.

	Arrive.	Depart.
No. 20 Limited Express	*1:35 A.M	*1.50 A.M
No. 6 Atlantic Express	*7:05	*7 30
No. 10 Buffalo Accom.	11:00	11.15
No. 8 C. & St. L. Exp.	*2:25 P.M	*2.55 P.M
No. 4 Special N. Y. Exp.	10:10	10.35
No. 2 San. Div. Accom.	10:12	
No. 12 Conneaut Accom.		4.50
Nottigham Accommodation (Sundays only)	10.05 A.M 4.45 P.M	9.00 A.M 2 15 P.M
No. 18 Elyria Accom.	8.50 A.M	

WEST BOUND TRAINS.

	Arrive.	Depart.
No. 13 Mich. Accom.		6.40 A.M
No. 1 Special Chicago Ex.	*6 35 A.M	7.00
No. 3 Toledo Express	1.25 P.M	3.30 P.M
No. 21 St. Louis Express	*1.40	*2.05
No. 5 Pacific Express	*7.05	*7.35
No. 11 Conneaut Accom.	8.40 A.M	
No. 19 Pt. Clinton Accom.		5.00
No. 7 Michigan Exp.	*2.50 A.M	*3.05 A.M
No. 17 N. Y. & Chi. Ex.	12.23 P.M	12.33 P.M

Cleveland, Columbus, Cincinnati & Indianapolis.

ARRIVALS.

No. 2 Col. & Cin. & Ind'pols Ex.	*7 10 A.M
No. 8 C. T. V. & W. & Clev Accom.	10 30
No. 12 St. Louis & New York Exp.	*3 00 P.M
No. 4 Special Cin & New York Exp.	*3 40
No. 10 Wheeling & Cleveland Exp.	7 15
No 6 Indianapolis & Columbus Exp.	10 20

DEPARTURES.

No. 1 Cincinnati & Columbus Exp.	8 00 A.M
No. 11 Cleve, Indianap. & Wheeling Ex.	7 10
No. 3 St. Louis & Cincinnati Ex	†2 00 P.M
No. 5 Night Express,	*7 25
No. 7 C. T. V. & W. & Col. Accom	4 00

†This train runs daily to Indianapolis and St. Louis, and daily, except Sunday, to Cincinnati.

Cleveland, Tuscarawas Valley & Wheeling.

ARRIVALS.

No. 4 Wheeling & Cleve'd Exp.	7 15 P.M
No. 2 Uhrichsville Accom.	10 30 A.M

DEPARTURES.

No. 1 Wheeling & Cleve'd Exp.	7 10 A.M
No. 3 Uhrichsville Accom.	4 00 P.M

New York, Pennsylvania & Ohio.

ARRIVALS.

No. 7 Mahoning Valley Accommo.	10 55 A.M
No. 8 New York Express,	*7 00 P.M
No. 1 New York Express,	6 50 A.M
No. 3 Pittsburgh Express,	*7 00 P.M
No. 5 Pittsburgh Express,	2 00
New York Express	2 00
No 9 Youngstown and Pitts. Local	10 15

DEPARTURES.

No. 12 New York Express,	*7 10 A.M
No. 4 Youngstown Local,	11 00
No. 8 Mahoning Accommodation,	4 25 P.M
No. 2 New York Express,	10 45
No. 12 Pittsburgh Express,	*7 10 A.M
No. 6 Pittsburgh & Main Line Express	2 30 P.M

Cleveland & Pittsburgh.

	ARRIVE.	DEPART
Mail	1 45 P.M	8 50 A.M
Express	6 55	2 30 P.M
Alliance Accommodation	10 15 A.M	3 45
Ravenna Accommodation	8 35	5 35
Night Express	6 30 A.M	†11 40 P.M

† Night Express runs daily, except Saturday, by way of Wellsville, and on Saturday by way of Alliance.

Valley Railway.

ARRIVE.	DEPARTURES.
No. 2 Accom. 10 15 A.M	No. 1 Mail 8 15 A.M
No. 6 Express 1 35 P.M	No. 3 Accom. 2 20 P.M
No. 4 Mail 6 30 P.M	No. 5 Exp. 6 05

Special trains leave on Sunday at 8.30 A.M. and 4.20 P.M., arriving at Cleveland at 10 A.M. and 6.25 P.M.

Trains leave from Depot foot of South Water Street.

Connotton Valley Railway.

Arrive.	Depart.
No. 1 10 05 A.M	No. 4 4 05 P.M
No. 3 7 15 P.M	No. 2 0 15 A.M

All trains arrive and leave depot corner Commercial and Fifth Streets

Cleveland, Akron & Columbus Railroad.

Cleveland, Akron & Columbus Railroad, running over Cleveland & Pittsburgh Railroad to Hudson, for Akron, Columbus, etc.

	ARRIVE.	DEPART.
Mail	1 15 P.M	8 00 A.M
Express	7 25	1 50 P.M
Accommodation	10 10 A.M	3 45 P.M

	Mail.	Fast Line.	Accom.	Night Expr'ss.
Leave Cleveland	8 50 am	2 30 pm	3 45 pm	11 40 pm
Arrive Hudson	10 00	3 28	4 50	12 50 am
Ravenna	10 40	3 53	5 50	1 18
Alliance	11 25	4 25	6 05 pm	2 05
N. Philadel	11 35 pm	7 15		10 55
Salem	12 25			3 02
Canton	12 28	5 47		3 20
Massillon via Alliance	12 50	6 06		3 38
Akron	10 42 am	4 10	5 40 pm	
Pittsburgh	3 30 pm	7 45		6 55
Wheeling	5 10	8 00		8 55
Marietta	8 45			
Harrisburg		4 15 am		4 00 pm
Philadelphia		7 50		7 35
New York		11 15		10 35
Baltimore		7 55		7 20
Washington		9 17		8 47
Boston		8 00 pm		

Ravenna Accommodation leaves Cleveland at 5:30 p m, reaching Ravenna at 7:15 p m; Akron 7:23 p m.

Newburgh Accommodations leave Cleveland at 11:00 a m and 12:30 pm. Returning, leave Newburgh at 11:10 am and 1:30 pm.

Passengers for New York, Philadelphia, Baltimore, Washington, and all points east of Pittsburgh make but one chang of cars, viz. at Union Depot, Pittsburgh, excepting those leaving on the Fast Line which has Pullman Sleepers from Cleveland to Philadelphia and New York.

The Fast Line leaving at 2;30 P. M. has elegant Pullman Palace Sleeping Cars through from Cleveland to New York without change. Pittsburgh Passengers who desire Parlor Car accommodations can secure seats in this car.

The Night Express has Pullman Sleeping Cars from Cleveland to Pittsburgh which can be occupied by passengers at Union Depot, Cleveland, any time after 9:00 P. M. At Pittsburgh passengers can take elegant through Parlor or Sleeping Cars for the East.

Sleeping and Parlor Car accommodations from Cleveland and Pittsburgh eastward can be secured at the Union Sleeping and Parlor Car Office Union Passenger Depot; of H. C. Marshal, Union Ticket Office, Wedicll House; or of the Ticket Agent at the Euclid Avenue Station.

Through tickets can also be secured at the same points. Baggage checked through from the Union Depot or from Euclid Avenue Station,

By the 8:50 A. M. train a through car leaves daily for Akron, Gambier, Mt. Vernon, Columbus and immediate points, without change.

The 2:30 P. M. train has through car for Akron, Orrville, Columbus and immediate points, arriving in Columbus at 9:25 P. M.

By the 3:45 P. M. Accommodation train cars run through without change from Cleveland to Cuyahoga Falls, Akron and Millersburgh,

Night Express leaving Cleveland at 11:40 P. M., runs daily, and makes connection at Wellsville for Steubenville, Bridgeport, Wheeling, Bellaire and intermediate points. Every night in the week except Saturday the night express runs via Wellsville. On Saturday nights it runs via Alliance. All other trains run daily except Sunday.

Trains arrive at Cleveland.—Night Express at 6:30 P. M., having Pullman Sleeper from Pittsburgh; Ravenna Accommodation, 8:35 A. M., Alliance Accommodation, 10:15 A. M.; New York Wheeling & Washington Mail, with Pullman Sleeping Car from New York and Philadelphia, 1:45 P. M.; New York, Philadelphia & Wheeling Express, 6:55 P. M.

WM. A. BALDWIN, General Manager.
E. A. FORD, Gen'l Pass. & Tkt. Agt. Pittsburgh, Pa.
C. L. KIMBALL, District Passenger Agent, corner Bank and St. Clair streets, Cleveland.

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POPULAR THOROUGHFARE

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☞ The unequalled facilities offered by this Company for luxurious travel are

Elegant, easy riding, Day Coaches,
Elegant Wagner and Woodruff Drawing Room and Sleeping Cars.
Elegant Horton Reclining Chair Cars, between Lake Erie (Cleveland,) **and the Mississippi River.** (St. Louis) **FREE.**

Model Hotel cars attached to Express Trains, which together with a track and road bed of known excellence, you are assured Comfort and Safety with

FAST TIME!

☞ Bear in mind that our through car routes are numerous and excellent, a great convenience to all travelers.

Consult your best interests by asking for and securing a Ticket via the Bee Line. For Maps, Time Tables, and other information, call on

E. B. Thomas, Gen'l Manager. O. B. Skinner, Traffic Manager.
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"Independent Lock Lever"

HAY AND GRAIN RAKE.

Patented August, 1867, January, 1875, June, 1875, and November, 1876. 60,000 now in use. Light touch of lever and driver's weight dumps it. Best self-dump in market. Twenty steel teeth. No complicated ratchet wheels, friction bands or other horse machinery needed to operate it. A small boy rakes easily twenty acres per day with the Coates' Lock Lever. Send for circulars.

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Milling Machines, Drill Presses
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Send for Illustrated Catalogue. No. 4 Milling Machine.

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Cleveland, O.,
Manufacturers of
Machinist Tools, Milling Machines, Die Sinkers, Universal Heads,
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Grinding Attachment for Lathes.
GEAR CUTTING.
OFFICE & WORKS, WM. EYNON & SONS,
No. 73 SCRANTON AVENUE.

Cleveland to New York
In Pullman Cars, via
Cleveland & Pittsburgh and Pennsylvania
RAILROAD.
ON and after Sunday, June 4, 1882, trains leave Cleveland and arrive at the points named below as follows: (Night Express runs daily, all other trains daily except Sundays.)

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COFFEES AND SPICES
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Manufacturers of
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Patented Dec. 13, 1881.

This Stove is acknowledged to be superior to all other Vapor Stoves.
AGENTS WANTED. Send for Illustrated Circular and Price List. Address
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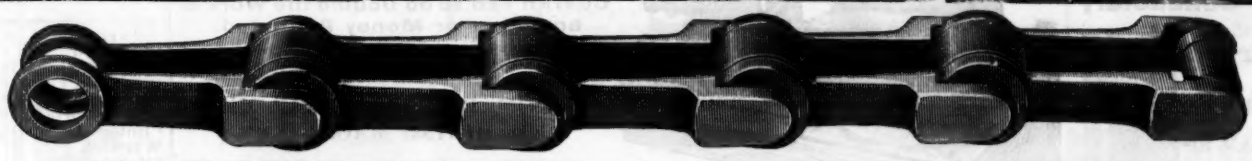
Correspondence solicited from Manufacturers.



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Founders and Machinists,
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The only Portable Safety Boiler made.
Unequaled for Economy of Fuel and Repairs.
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UNION TUBE WORKS, NEWCASTLE, PA.
MANUFACTURER OF
LAP WELDED BOILER TUBES
FROM BEST AMERICAN
Charcoal Hammered Iron.

Crowl's Patent Iron
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For Steep or Flat Roofs.
NO MORE NOISE OR LEAKING
TIN AND SLATE ALSO FURNISHED.
Agents wanted in every County.
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Model Furnace for 1881,
All steel, light and durable, with Revolving Grate, etc. Also
Judson's Practical Stoking Attachment
Guaranteed to feed coal, coke or charcoal without choking the draft.
Manufactured only by the patentee,
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And Tinners' Tools, &c.
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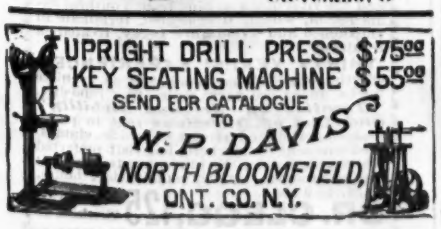

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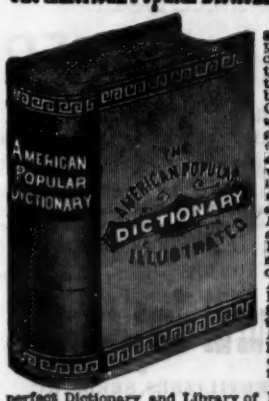

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Specialty of Portable Saw Mills and High Speed Engines.

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Expanding Water Conductor,
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S. S. S. Conductor Co.
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THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

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BOILER MAKER,

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Special attention paid to taking out and Piecing Portable Flues
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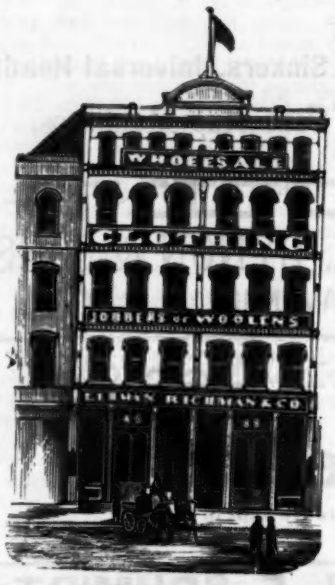

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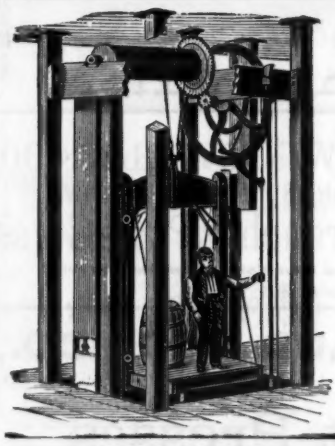

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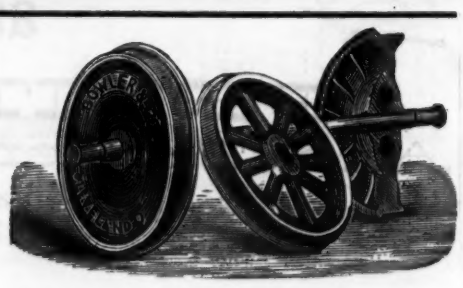

Blue Grass Route of Ohio

TIME TABLE.

The Cleveland, Mt. Vernon and Delaware RAILROAD.

GEO. D. WALKER, RECEIVER.

Schedule No. 5--Dating from Sunday, June 4.

SOUTH-BOUND TRAINS.

STATIONS.	Accom	Accom	Expr	Mail	Sunday only
Leave.	P. M.	P. M.	P. M.	A.M.	P.M.
Cleveland	5.30	3.45	2.30	8.50	....
Hudson	6 53	5.02	3.35	10.10	4 20
Cuyahoga Falls	7 11	5.30	3.53	10.29	4 40
Akron	7 23	5.46	4.10	10.42	5 00
*North Portage	P M	6.00	4 24	10.54*	6 14
Clinton	....	6 19	4.44	11.09	5 31
Warwick	.....	6 29	4.49	11.14	5 37
*Marshallville	.....	6.43	5.02	11.27*	5 50
Orrville	.....	6 58	5.14	11.42	6 08
*Apple Creek	.....	7.17	5 32	11.58*	6 22
Fredricksburg	.....	7.32	5.45	12.11	6 37
*Holmesville	Accom	7.43	5 55	12.21*	6 48
Millersburg	A. M.	7.55	6.08	12.34	7 00
		P.M.			A.M.
Millersburg	5.50	.....	6.08	12.34	7 00
*Killbuck	6.02	.....	6.20	12.47*	7 12
*Black Creek	6.18	.....	6.31	12.59*	7 25
Gann	6.33 B 6.53 S	.....	6.51 7.11 S	1.19	7 47
Danville	7 04	.....	7.20	1.29	7 59
Howard	7.18	.....	7.29	1.38	8 10
Gambier	7.22	.....	7.38	1.47	8 20
Mt. Vernon	7.35	.....	7.51	2.00	8 33
*Bangs	7 45	.....	8.01	2.1 *	8 45
*Mt. Liberty	7.53	.....	8.09	2.20*	8 54
Centerburg	8.05	.....	8.18	2.30	9 05
*Condit	8.19	.....	8.32	2.44*	9 19
*Sunbury	8.27	.....	8.40	2.58*	9 28
*Galena	8.32	.....	8.45	2.58*	9 34
Westerville	8.48	.....	9.00	3.15	9 50
Arrive at Columbus	9.15	.....	9.25	3.40	10 20
	A.M.		P.M.	P.M.	A.M.

NORTH-BOUND TRAINS.

STATIONS.	Expr	Mail	Accom	Accom	Sundays only
Arrive at	P M	P. M.	A. M.	A. M.	A.M.
Cleveland	1 45	6 55	10.15	8.10	....
Hudson	12 35	5.48	8.53	7.15	10.30
Cuyahoga Falls	12 16	5 30	8.33	6 58	10.11
Akron	12 03	5.17	8.20	6 45	9.50
*North Portage	11.46	5.00*	8.03	A. M.	9.34
Clinton	11 30	4 44	7.46	.....	9.18
Warwick	11.25	4 37	7.37	.....	9.12
*Marshallville	11.10	4.27*	7.23	.....	9.00
Orrville	10.57	4.14	7.10 B 6.40 S	.....	8.47
*Apple Creek	10.40	3.56*	6.22	.....	8.27
Fredricksburg	10.26	3.43	6.08	.....	8.13
*Holmesville	10 16	3.33*	5.58	Accom	8.02
Millersburg	10.05	3.22	5.45	P. M.	7.50
			A. M.		P.M.
Millersburg	10 05	3.22	.....	8.35	7.25
*Killbuck	9 51	3.08*	.....	8.23	7.13
*Black Creek	9 39	2.57*	.....	8.11	7.00
Gann	9.17	2.36	.....	7.49	6 38
Danville	9.07	2.27	.....	7.39	6.25
Howard	8.58	2.18	.....	7.29	6.14
Gambier	8.49	2.09	.....	7.14	6 03
Mt. Vernon	8.37	1.57	.....	7.02	5.51
*Bangs	8.22	1.40*	.....	6.46*	5.37
*Mt. Liberty	8.14	1.31*	.....	6.37	5.28
Centerburg	8.05	1.22	.....	6.28	5.17
*Condit	7.51	1.09*	.....	6.14	5.03
*Sunbury	7.42	1.01*	.....	6.06	4.53
*Galena	7.37	12 56*	.....	6.00	4.47
Westerville	7.20	12.40	.....	5.43	4.30
Leave Columbus	6.55	12.15	.....	5.15	4.00
	A. M.	P.M		P. M.	P.M.

* Stop on signal. B Breakfast. S Supper.

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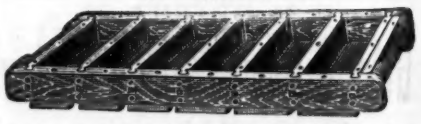

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One 8-Horse Power.

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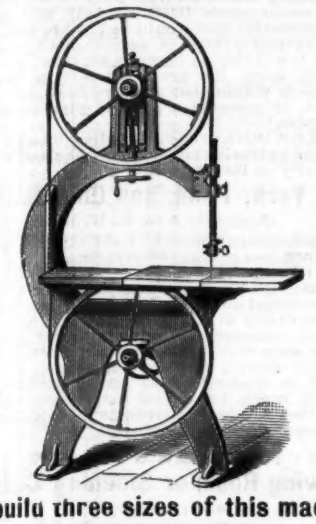

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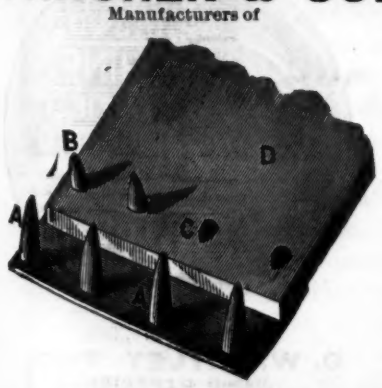

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For grinding green, raw bones without any preparation, into Bone Meal, suitable for Stock, Fowls and Fertilizer. Also for Oyster Shells, Guano, Chalk, Lime, Slate and Soapstone, Feed Corn, &c., &c.
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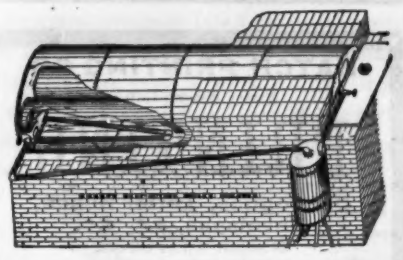

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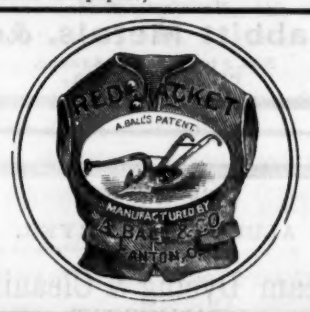

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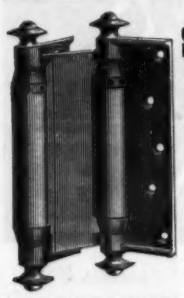

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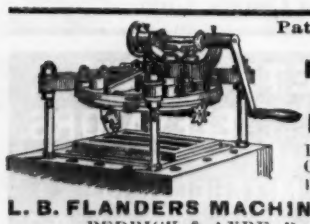

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Descriptive Circular on application.
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REQUIRES BUT LITTLE STEAM TO OPERATE IT. PUMPS ALMOST ANYTHING.

Is a real substantial and efficient
DOUBLE-ACTING STEAM PUMP,
Without any mechanical arrangement to absorb power, or get out of order.

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THE STEAM IS MADE TO DO DOUBLE DUTY.

Its operation is sustained by steam pressure, brought directly upon the liquid (a cushion of air only intervening) as the forcing elements, while its subsequent condensation furnishes the lifting power.

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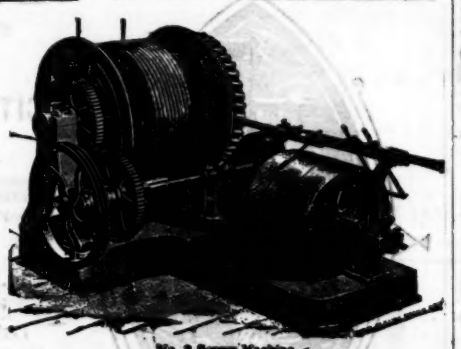

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